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Index to Authors, January—June, 1922

Adams, John D. 61 Adams, Mildred. 543 Agnew, Hugh E. 11 Address, Dr. J. Mace, 219 Ayres, E. F. 114 Bankson, E. E., 223, 343, 479 Bartholomew, Harland, 457 Bartlett, D. K. 147 Bassett, E. M. 50, 230, 625 Batchelor, W. C. 342 Belk, C. E. 32 Besselievre, E. B. 356 Betheva, Helen 312 Bevitt, E. D. 474 Black, Russell V. N. 254 Body, F. Leslie 369 Bosse, Benjamin 134 Bowers, Fred 594 Bradley, E. A. 375 Breed, H. Eltinge. 335 Budd, R. W. 61 Buettnier, Leo J. 323 Butler, J. C. 47 Buttrick, P. L. 429 Cairns, G. H. 420 Campbell, Carlos C. 475 Cann, W. E. 567 Carlson, Samuel A. 442 Carrington, T. C. 165 Carter, J. C. 267 Child, Stephen H., 5, 103, 437, 560 Colby, E. E. 242 Cooke, Lee R. 385 Corcoran, H. P. 593 Cotton, O. D. 219 Coulter, Waldo S. 427 Dana, John Cotton. 359 Davenport, O. F. 125 Davidson, Herbert M. 52 Davidson, Lillian R. 52 Davis, D. B. 220 Davis, D. E. 223, 343, 479 Dollahan, H. L. 573 Drennan, Thomas J. 566 Dunn, C. F. 373	Eisenbeis, B. H. 565 Engler, Irvin 169 Evans, Frederick N. 136 Finley, C. A. 223, 343, 479 Foster, R. L. 283 Franklin, C. J. 431 Fraser, Gilbert S. 537 Fredenburg, Geo. B. 566 Gable, John E. 271 Gairnes, Price 373 Garrett, George 33 Gilbert, Aletha 240 Griffith, M. D. 269 Gross, Edward Z. 450 Hagmeier, O. C. 477 Hall, C. H. 59 Hansen, A. E. 39 Hapgood, B. A. 595 Hardy, W. F. 32 Harth, W. H. 33 Haynes, Edward M. 568 Headrick, Wm. C. 171 Hennessey, C. O'C. 625 Henry, R. G. 138 Hilton, Fred E. 275 Hinkle, T. L. 591 Hirschfield, M. R. 310 Hirst, A. R. 454, 538 Holmes, Florence. 611 Horn, A. J. 595 House, Harrison L. 1 Hulse, Fernald E. 215 Husted, A. M. 179 Hyman, E. H. 478 Jaudon, H. S. 29 Jellison, L. J. 233, 317 Johnson, Geo. A. 417, 569 Johnson, J. W. 20 Johnson, Wendell F. 36 Jones, Ira B. 34 Jones, P. A. 171, 474 Jordan, Frank A. 165 Kelley, Robert F. G. 43 Kilman, Julian 273 King, J. H. 316 Koiner, C. W. 623 Kuhnert, Julius. 149	Larner, Herbert B. 435 Lee, Robert E. 340 Leland, Arthur 241 Lenhardt, L. G. 564 Lewis, D. Hodson. 65 Lewis, Nelson P. 209 Lewis, W. I. 449 Lill, Thomas R. 181 Lorg, James H. 121 Madison, Charles I. 242 Mandel, Arch. 37 Marple, Albert 7 Marsh, H. W. 442 McLean, Bobby 145 McLow, H. L. 354 Metcalf, Ernest L. 138 Moore, Cora Lee. 251 Moreland, James B. 132 Moshier, Wm. E. 152, 623 Moynihan, A. J. 231 Murphy, G. T. 271 Niles, Chas. M. 366, 446 Olsen, Louis 137 Palmer, George T. 555 Parmley, Walter C. 443 Parsons, Frank J. 195 Pennybacker, Mrs. Percy V. 627 Perry, Chesley R. 599 Peters, Dr. A. O. 322 Pierce, W. Dwight, 109, 327, 607 Pinney, Sedley H. 258 Pinson, James H. 63 Pollock, J. R. 118 Pritchard, Asa B. 568 Rahn, W. W. 269 Raitt, C. B. 567 Rall, J. F. 621 Rather, L. H. 539 Rebock, Horace M. 341 Reed, D. A. 361 Reed, P. B. 143 Ridley, Clarence E. 563 Rietke, H. W. 136 Rigger, C. E. 339 Robinson, D. E. 371	Robinson, John I. 132 Rolfe, William E. 452 Schaphorst, W. F., 67, 491, 613 Scharff, A. K. 379 Scott, O. S. 28 Sellers, Charles L. 470 Shatts, W. Phillip. 593 Shepherd, C. H. 583 Sherman, Caroline B. 277 Sherwood, H. F. 61 Sim, George 449 Simmons, Charles A. 379 Smith, C. A. 107 Smyth, R. P. 478 Spear, Walter E. 23 Spencer, D. G. 63 Stafford, James G. 476 Steele, V. H. 341 Stephens, J. H. 235 Stineman, Norman M. 314 Street, F. L. 32 79, 185, 289, 393, 505, 605, 629 Sulzer, A. E. 213 Swan, Herbert S. 579 Tracy, J. A. 177 Unger, Adolph 448 Washington, H. A. 466 Watts, John C. 421 Weil, Lionel 549 Welch, Major W. A. 319 Wells, M. D. 243 Wenzel, H. C. 337 Westoby, H. 477 White, Charles E. 474 Whittin, Frederick II. 123 Whitten, Robert 541 Williams, Stuart L. 592 Wilson, H. Lee. 557 Wolfe, Thomas F. 467 Wollmuth, E. W. 377 Wood, L. A. S. 3, 425 Woodward, James F. 576 Wright, Stanley 227 Wyatt, Roscoe D. 267 Yarger, F. L. 448
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Index to Subjects, January—June, 1922

As an aid to readers of THE AMERICAN CITY in looking up references, the page numbers of the individual issues of the volume are given:

January, 1-101	April, 307-415
February, 103-207	May, 417-531
March, 209-305	June, 533-647

Accident Prevention

—Analysis of Public Accidents (pamphlet notice)	293
—Highway Travel Dangers—Blinding Headlight and One-Light Car (photograph)	229
—Lantern Warning at Night	7
—Negligence of City or Traction Company in Trolley-Pole Accident Not Proved—Gulfport, Miss.—(legal decision)	187
—Publication on	85
—Road Accidents Minimized in Maryland	368
—Road Design, Safe	553
—Steps for Public Buildings, Safe	405
<i>See also "Fire," "Lighting," "Traffic"</i>	

Accounting, Municipal and County— *See "Finance"*

Americanization

—Logan, Utah	371
—Rochester, N. Y.	273

Auditoriums—*See "Buildings"*

Baths and Swimming Pools

—Baltimore, Md., Bath-House with Laundry ..	43
—Birmingham, Ala.	312
—Frostburg, Md., Swimming Pool	165
—Harrisburg, Pa., Bathing-Beach	449
—Johnstown, Pa., Swimming Pool	557
—Omaha, Nebr., Bath-House in Small Park ..	34
—Palo Alto, Calif., Swimming Pool	136
—Polling-Booths Used for Bath-Houses, Newark, Ohio	449
—Waterproofed Cement for Outdoor Swimming Pools	297

"Before and After" Pictures

—Highways	
Polk County, Fla.	29
Springfield, Ill.	269
Transportation Facilities Improved	49

Bill-Boards and Signs

—Bill-Board Blight	463
—Highway Sign-Posts	
of Concrete	46
Portsmouth, N. H.	61
—Street Signs	
Knoxville, Tenn., Board of Commerce Installations Signs	474
Pontiac, Mich., Tries Oversize Signs	563
San Francisco, Calif.	253
—Traffic Signs	
Somerville, Mass., Uses Old Hitching-Posts ..	568
Water-Supply Advertised, Wayndotte, Mich. ..	63

Bond Issues—*See "Finance"*

Bridges

—Cantilever Bridge Planned for Decatur, Ill. ..	31
—Cedar Rapids, Iowa, Business Section with Seven Bridges	34
—Concrete Bridge, Rome, N. Y.	446
—Port Smith, Ark.	516
—Turkish Bridge near Mt. Parnassus (photograph)	27

Buildings, Public

—Hickory, N. C., Municipal Building	137
—Newton, Kans., Auditorium	593
—Plainfield, N. J., Municipal Building (photograph)	129
—Plainview, Tex., Auditorium	477
—Sound-Proof Construction (pamphlet notice) ..	511
—Springfield, Mass., Municipal Group, Etching ..	595
—Steps for Public Buildings, Safe	405
—Waterbury, Conn., City Hall	130
—Watertown, Mass., City Hall (pamphlet notice) ..	191
<i>See also "Civic and Commercial Organizations," "Community Buildings"</i>	

Celebrations, Civic

—Fourth of July	627
-----------------------	-----

Cemeteries

—American Cemetery Law (book review)	633
--------------------------------------------	-----

Chamber of Commerce Activities in Public Affairs—*See "Civic and Commercial Organizations and Their Work"*

Charities

—Chicago, Ill. (pamphlet notice).....	193
—Community Chest, Cleveland, Ohio.....	452
—Fuel Yard, Sharon, Pa.....	472
—Legal Aid, New York, N. Y. (pamphlet notice).....	513
—New York, N. Y., Municipal Lodging-House.....	250
—Panhandlers.....	106
—Poor Relief	
Massachusetts, 1620-1920 (book review).....	399
Toledo, Ohio.....	36

Child Welfare

—Chicago, Ill. (pamphlet notice).....	295
—Child Labor Decision, 1922.....	552

City Manager Plan

—Bluefield, W. Va.....	563
—Kenosha, Wis.....	281
—Lima, Ohio.....	179
—Watertown, N. Y.....	179

City Planning and Replanning

—Administrative and Financial Machinery for Carrying Out the City Plan.....	579
—Aerial Photography—A New Aid in City Planning	
Richmond, Calif., Airplane View (photograph).....	209
American Falls, Ida.....	565
Asheville, N. C.....	254
Bristol, Conn. (pamphlet notice).....	281
Chicago, Ill. (pamphlet notice).....	191
City Planning Commission as Publicity Agent	
Decatur, Ill., City Plan a Moral Force.....	399
East Orange, N. J. (pamphlet notice).....	385
Engineer's Part in City Planning.....	31
European Countries.....	633
Germany.....	326
Granville, N. Y., to Have City Plan.....	560
Hamilton, Ohio (pamphlet notice).....	437
Hightstown, N. J.....	93
Holland.....	191
Insect Pests Must Be Considered in City Planning.....	281
Johnstown, Pa.....	103
Kokomo, Ind.....	607
Layout Plan, Preparation of.....	323
Massachusetts.....	470
Memphis, Tenn. (pamphlet notice).....	173
New York, N. Y., Metropolitan District.....	113
Port Development.....	513
Principles of.....	533
Publications on.....	238
Richmond, Calif.....	457
Spartanburg, S. C.....	513
Topographic Survey in Relation to City Engineering, Flint, Mich.....	565
Watertown, Mass. (pamphlet notice).....	63
Zoning	
Akron, Ohio (pamphlet notices).....	118
Appeals, Board of.....	511
Atlanta, Ga., Adopts Zoning.....	461
Bibliography.....	513
New Rochelle, N. Y., Ordinance (pamphlet notice).....	513
New York Zone Plan Growing Stronger..	401
Ordinances for Interim Zoning.....	625
Paterson, N. J. (pamphlet notice).....	230
Premature, Piecemeal Zoning Receives a Setback, Pittsburgh, Pa.....	635
Premature Proceedings Contesting Zoning Ordinance Dismissed—Cliffside Park, N. J. (legal decision).....	128
Property Values Increased by Zoning, Chicago, Ill.....	397
San Francisco, Calif. (pamphlet notice).....	542
Why Zoning Pays.....	513
Why Zoning Pays.....	279

Civic and Commercial Organizations and Their Work

Albany, Ala.....	269
Albany, N. Y.....	597
Ashtabula, Ohio.....	594
Ballinger, Tex.....	592
Bristol, Conn.....	91
Brockton, Mass.....	273
Calumet, Mich.....	271
Canon City, Colo.....	373
Corpus Christi, Tex.....	267
Elizabeth, N. J.....	269
Frostburg, Md.....	165
Guelph, Ont.....	476
Indianapolis, Ind.....	163
Johnstown, Pa.....	271
Keene, N. H.....	373
Knoxville, Tenn.....	474
Lexington, Ky.....	371
Lockport, N. Y.....	65
Logan, Utah.....	369
Los Angeles, Calif.....	38
Memphis, Tenn.....	169
Middletown, Conn.....	591
Muncie, Ind.....	478
Newark, N. J.....	375
New Haven, Conn.....	593
New Orleans, La.....	473
Newton, Kans.....	593
Plainview, Tex.....	477
Portsmouth, N. H.....	61
Poughkeepsie, N. Y.....	61
Rochester, N. Y.....	273
Rome, N. Y.....	474
Sacramento, Calif.....	167

San Francisco, Calif.....	377
San José, Calif.....	265
Santa Rosa, Calif.....	476
Seaside, Ore.....	477
Sharon, Pa.....	171, 474
Sioux City, Iowa.....	59
Spartanburg, S. C.....	63
—Advertising Signs Removed from Street Poles, New Orleans, La.....	379
—Americanization, Rochester, N. Y.....	273
—Auditoriums	
Newton, Kans.....	593
Plainview, Tex.....	477
—Auto Camps	
Albany, Ala.....	269
Corpus Christi, Tex.....	267
—Ballot-Counting Machine Introduced, Bristol, Conn.....	91
—Buildings for Commercial Bodies	
Lockport, N. Y.....	65
Sacramento, Calif.....	167
—Citizenship Fostered, Logan, Utah.....	369
—City Plan, Spartanburg, S. C.....	63
—Collection Letter, Sharon, Pa.....	171
—College Endowment Fund Campaign, Poughkeepsie, N. Y.....	61
—Easter Egg Hunt, Muncie, Ind.....	478
—Etching of Municipal Group, Springfield, Mass.....	595
—Exposition of Industry and Trade, Power-Plant Display, Los Angeles, Calif. (photograph).....	38
—Fire Prevention	
Indianapolis, Ind.....	163
School Essay Contest, Newark, N. J.....	375
—Fuel Yard, Sharon, Pa.....	474
—Highways	
Ballinger, Tex.....	592
"Before and After" Views, Springfield, Ill.....	269
Bond Campaign, Sioux City, Iowa.....	59
Colorado Cities Build Highway by Volunteer Labor.....	375
Educational Campaign for Road Construction, Johnstown, Pa.....	271
New Orleans, La.....	473
—Hospital Drive, Keene, N. H.....	373
—Hospitality Committee, San Francisco, Calif.....	377
—Housing Corporation, Wilkes-Barre, Pa.....	57
—Industrial Exhibit, Brockton, Mass.....	273
—Market-House Promoted, Lexington, Ky.....	371
—Motion Pictures for Community Advertising, San José, Calif.....	265
—Music, Community, Memphis, Tenn.....	169
—National School for Commercial Secretaries	603
—Park from Waste Space, Calumet, Mich.....	271
—Playground Made from Dumping-Ground, Guelph, Ont.....	476
—Public Improvements, Elizabeth, N. J.....	269
—Radio Meeting, Albany, N. Y.....	597
—Rest Room, Rome, N. Y.....	474
—Rotary, How It Works.....	599
—School Boys Visit Industries, New Haven, Conn.....	593
—School Project, Santa Rosa, Calif.....	476
—Sea-Wall, Seaside, Ore.....	477
—Sign-Boards, Portsmouth, N. H.....	61
—Street Railway Question Settled, Ashtabula, Ohio.....	594
—Street Signs, Knoxville, Tenn.....	474
—Summer Schools for Commercial Secretaries	265
—Swimming Pool, Frostburg, Md.....	165
—Water-Plants and Supply	
Advertising Water-Supply, Wyandotte, Mich.....	63
Bond Campaigns	
—Stevens Point, Wis.....	369
—Wheeling, W. Va.....	592

Civil Service

—Do Civil Service Rules Promote Efficiency?..	442
—Make It Do What It Was Intended to Do..	623
—Publication on.....	511
—Public Personnel Administration, Principles of (book review).....	191
—St. Paul, Minn. (pamphlet notice).....	513

Comfort Stations—See "Health"

Community Buildings and Centers

—Odessa, Wash.....	136
—Parties, Programs for (pamphlet notice).....	635
—Publication on.....	293
—Toledo, Ohio, Plans Recreation Program.....	36

Community Councils

—Boise, Ida.....	114
------------------	-----

Conferences, Conventions and Exhibitions

.....	65, 161, 247, 379, 472, 578
—American Water Works Association, 1922..	548
—Boulder, Colo., "Know Your Community".....	241

Laundries, Public	
—Baltimore, Md., Laundry in Bath-House.	43
Law, Municipal	
—Access by Citizens to Municipal Data, Established, San Francisco, Calif.	281
—Legal Decisions	629
79, 185, 281, 289, 393, 505, 605,	
—Ordinances	193
Chimney Construction (pamphlet notice).	
Fire Alarm Boxes Required in Schools, Hospitals, Hotels, Theaters, Columbia, S. C.	32
Legal Decisions on	
—Ashes, Removal of, from Dwellings; Valid—Baltimore, Md.	509
—Daylight Saving; Valid—Cincinnati, Ohio	631
—Hospital for Contagious Diseases Prohibited Within City; Invalid—San Diego, Calif.	79
—Hospital Construction of Non-Inflammable Materials; Valid—Dublin, Ga.	289
—License Taxes Against Sellers of Used Automobiles; Valid—San Francisco, Calif.	629
—Newspaper Sale, Suppression of; Ordinance Defined	185
—Pool-Room Regulation; Valid—Ocilla, Ga.	189
—Private Property, Enjoyment of, Obstructed; Invalid—Kansas City, Kans.	629
—Professional Men Taxed; Valid—Maysville, Calif.	393
—Soft Drink License; Invalid—Westville, Ill.	189
—Zoning, Premature Proceedings Contesting; Valid—Cliffside Park, N. J.	397
Street Railway Service-at-Cost, Toledo, Ohio	566
Zoning	
—Interim	230
—New Rochelle, N. Y. (pamphlet notice)	410
—Property Owned by City May Be Resold—Bristol, Va.—(legal decision)	397
—Trespass on Abutting Land in Highway Construction	605
Liability, Municipal (legal decisions on)	
—Affirmed	
Assault by Superintendent of Water-Works Department upon Patron—Durham, N. C.	395
Overflow of Ocean on Private Property—Southampton, L. I.	397
Libraries, Public	
—American Library Association Conference (pamphlet notice)	295
—Los Angeles, Calif. (photograph)	257
—Picture Collections for Libraries	142
—Special Libraries Directory (pamphlet notice)	293
Lighting, City and Street	
—Adequate and Attractive Lighting of City Streets	3
—Dangers Eliminated by Proper Highway Lighting (photograph)	229
—Diesel Engine in Light and Water Works	
Amory, Miss.	529
Freeport, N. Y.	227
Kansas City, Mo.	573
Kokomo, Ind.	472
Lincoln Highway	517
Mandan, N. Dak.	143
Miami, Okla., Light Plant.	139
Mt. Clemens, Mich.	197
Natural Gas, Kane, Pa.	28
—Night Travel Safe Between Schenectady and Albany, N. Y. (photograph)	347
—Posts and Fixtures, Lighting	3, 93, 197, 425
Columbus, Ind. (photograph)	93
Kane, Pa.	28
Kansas City, Mo.	573
Kokomo, Ind.	472
Lexington, Ky.	212
Lincoln Highway	517
Miami Beach, Fla.	197
Salt Lake City, Utah (photograph)	3
Trolley Poles, Use of	3
Tubular Steel Lamp Standards	529
Vincennes, Ind. (photograph)	5
—Prescott, Ariz.	310
—Rates	
Gainesville, Fla.	421
Greenville, Tex.	355
—Series Multiple Street Lighting	87
See also "Municipal Ownership," "Utilities"	
Manufacturers' and Contractors' Items.	87, 195, 297, 403, 515

Markets, Public	
—House for Market, Lexington, Ky.	371
—Publications on	191, 295
—Street Markets in the United States	277
Publications on	511
Methods, Materials and Appliances—See "Manufacturers' and Contractors' Items"	
Milk, Inspection and Regulation of—See "Health"	
Mosquito Extermination—See "Health"	
Motion Pictures	
—Community Advertising, San José, Calif.	265
—Publication on	399
—Road Building	358
Motor Apparatus	
—Ambulances (photographs)	588
—Busses (pamphlet notice)	399
—Fire Department Equipment	
Cable for Fire Alarm Hauled by Truck, Cleveland, Ohio (photograph)	55
Photographs	157, 263, 365, 469
Pumpers	201, 531
—Garages, Municipal	159
—Lawn-Mower	405
—Motor-Cycles	
Massachusetts State Police Patrol	207
Photographs	156, 468
—Police Departments	
Motor-Cycle Patrol	
—Massachusetts	207
—Photographs	156, 468, 588
—Publication on	85
—Road Machinery	
Graders and Rollers	515
Photograph	156
Truck for Road Maintenance	525
—Snow Removal	
Plow	205
Raimier National Park	201
Road Grader as Snow-Plow, Great Bend and Salina, Kans.	87
—Sprayer	521
—Tires, Pneumatic	301
—Tractors and Trucks	
Buenos Ayres, Argentine (photograph)	54
Garbage Handling, Akron, Ohio	403
Fire Department, Newport, Ky.	403
Golf Courses	
—Cleveland, Ohio	413
—Toledo, Ohio	413
Highways (photographs)	
—Brooklyn, N. Y.	365
—Memphis, Tenn.	364
—Minneapolis, Minn.	262
Snow Removal	
—Plow, Tractor-driven	205
—Raimier National Park	201
Street Railways, Detroit, Mich. (photographs)	54, 589
Street Sprinkling, Three Rivers, Que. (photograph)	364
—Waste Collection	
Akron, Ohio	403
Dump Bodies	89
Washington, D. C.	8
Municipal Ownership	
—Bread Shop, Tiffin, Ohio	447
—Electric Light, Power and Water Plants	
Amory, Miss.	529
Ballinger, Tex.	592
Gainesville, Fla.	420
Miami, Okla.	139
—Foodstuffs, City's Right to Engage in Sale of	505
—Gas and Water Plant, Duluth, Minn.	361
—Power-Plants	
Grafton, Ill.	527
United States and Canada	619
—Water-Plant, Stevens Point, Wis.	369
See also "Lighting," "Public Works," "Utilities," "Water-Supply"	
Museums, City	359
Music, Community	
—Memphis, Tenn.	169
—Norwich University of Municipal Affairs	5
Nuisances	
—Noise	
Newark, N. J., Schools Demand Noiseless City Streets	351
Publication on	635
—Overflow of Ocean on Private Property; Village Liable—Southampton, L. I.—(legal decision)	397
—Sewage Discharged in Stream; Actionable Nuisance—Cushing, Okla.—(legal decision)	397
See also "Smoke"	

Ordinances—See "Law, Municipal"

Pageantry

—Publication on 83

Parks

—American Falls, Ida. 257
—Calumet, Mich. 271
—Charlotte, Mich., Develops a City Park by
 Reforestation 429
—in City Planning 460
—Detroit, Mich. (pamphlet notice) 85
—Evansville, Ind. 133
—Granville, N. Y., to Have Park System. 93
—Kokomo, Ind. 471
—Lawn-Mower 405
—Lawn-Sprinkling System, Detroit, Mich. 95
—Omaha, Neb., Small Park—"No Man's
 Home" 34
—Petersburg, Va. 411
—Photograph 363
—Property Values Increased by Parks, Spring-
 field, Ill. 127
—Roseway, Portland, Ore. 611
—Somerville, Mass., Abandons Narrow Park-
 way 51
—Spartanburg, S. C. 63
—Springfield, Ill. 125
—State Parks (pamphlet notice) 399
—Street Railway Track Parkway, Salt Lake
 City, Utah 214
—Tractors for Golf Courses 413
—Trees Transplanted by Aid of Motor Truck
 (photograph) 234

Pavements—See "Highways"

Pensions in Public Employment

—Publication on 635

Police

—City Mother, Los Angeles, Calif. 239
—Motor Apparatus
 Motor-Cycles (photographs) 468
 —Macon, Ga. 156
 —Little Rock, Ark. 588
 Patrol Cars (photographs)
 —with Ambulance, Oak Park, Ill. 468
 —Milwaukee, Wis. 191
—Penology in the United States (book review). 51
—Salaries of Patrolmen, Harrisburg, Pa. 393
—Speed Regulations as Applying to Motor-
 Cycle Policemen—Duluth, Minn.—(legal
 decision) 474

**Power-Plants, Municipal, and Their
Equipment**

—Boiler Cleaners 491
—Boiler-Feed Regulators 613
—Coal- and Ash-Handling Machinery. 199
—Diesel Oil Engines
 Amory, Miss. 529
 Crowley, La. 91
 Grafton, Ill. 527
—Gainesville, Fla. 420, 586
—Greenville, Tex. 354
—Lignite Replaces High-Grade Coal in Municipal
 Power-Plant, Moorhead, Minn. 217
—Los Angeles, Calif., Display at Industrial
 and Trade Exposition (photograph) 38
—Miami, Okla. 139
—Municipally Owned Power-Plants. 619
—Rates
 Gainesville, Fla. 421
 Greenville, Tex. 355
—Softening of Water for Boiler Feed. 299
—Stokers, A Discussion of 218
—Superheaters, Selection of 67
—Swimming Pool, Palo Alto, Calif., Operated
 by Power-Plant 136

Problems of Cities 307

—Attainable Standards (pamphlet notice) 511

Publications

—Book and Pamphlet Notices. 83, 191, 293, 399, 511
—Manufacturers' Literature on Methods, Ma-
 terials and Appliances. Adv. pp. 4 and
 6 in each issue
—Municipal Reports 85, 193, 401
 Clarksburg, W. Va. 313
 Rochester, N. Y. 314

Publicity, City

—Post-Cards of Chicago Prepared by Municipal
 Art League 19
—Water-Supply Advertising Gives Publicity to
 Wyandotte, Mich. 63

Public Works

—Cost Keeping (book review) 293
—Greece 23
—Prescott, Ariz. 310

—St. Paul, Minn., Saves Money on Public
 Works 337

—Unemployment Problem, Public Works Con-
 struction to Help Solve, Toledo, Ohio. 35

Real Estate Agent, City, Milwaukee, Wis. 389

Recreation, Public

—in City Planning 460
—Easter Egg Hunt, Muncie, Ind. 478
—Golf, "Pick-and-Shovel," Sacramento, Calif. 448
—Grand Stand, Sectional 99
—Playgrounds
 Guelph, Ont. 476
 Harmon Foundation for Establishing Play-
 grounds 128
 Lewiston, Pa., Layout for Playgrounds. 577
 Mechanical Greased Pig 409
 Newport, R. I., Children Work for Play-
 ground Supplies 240
—Pool-Rooms, Municipal Regulation of (legal
 decisions)
 Atwood, Ill. 631
 Ocilla, Ga. 189
—Publications on 293, 635
—Reservoir Roof Used for Tennis Courts,
 Arkansas City, Kans. 108
—Skating, Municipal 145
—Springfield, Ill. 126
—Tennis Courts in London, Eng. 318
—Theater, Open Air, Santa Monica, Calif. 340
—Toledo, Ohio, Plans Free Entertainments. 36
—Tourist Camps
 Ballinger, Tex. 592
 Corpus Christi, Tex. 267
 Pueblo, Colo. 242
 Springfield, Ill. 127
—Utica, N. Y., "Sells" Recreation to the City. 342
—Vacation Camps, Los Angeles, Calif. 567

Rest Rooms, Public

—Rome, N. Y. 474
—Rio de Janeiro, Brazil (photograph) 456

Roads—See "Highways"

Rural Development

—Publications on 293, 513, 633

Salaries of Public Employees

—City Clerks 330
—County Engineers, Idaho 445
—in County Institutions 152
—Engineers 391
—Fire Chiefs 248
—Wage Standardization 154

Schools, Public

—Attendance in Delaware Schools (pamphlet
 notice) 191
—Bird Study 389
—Bonham, Tex., Schools Lead Fight Against
 Mosquitoes 539
—Chicago, Ill. (pamphlet notice) 401
—Concrete Schoolhouses (pamphlet notice) 193
—Detroit, Mich., Education Budget (pamphlet
 notice) 295
—Fire Losses in School Buildings. 314
—Fire Prevention Essay Contests
 Newark, N. J. 375
 New York, N. Y. 566
—Industries Visited by School Boys, New
 Haven, Conn. 593
—Opportunity School, Columbus, Ohio. 564
—Picture Collections for Schools. 142
—Rural School Consolidation (book notice) ... 191
—Santa Rosa, Calif., School Rebuilding Project
 476

Sewers and Sewage Disposal

—Backfilling by Drag-Line on Wetherby Sewer,
 Detroit, Mich. (photograph) 262
—Catch-Basin Cleaning, Akron, Ohio. 222
—Cleaning Sewers
 Antigo, Wis. 305
 Schenectady, N. Y. 353, 590
—Concrete Pipe Sewers, Laying. 16
 Jackson, Mich. (photograph) 157
—Contract for Sewage Disposal Plant Rescinded
 on Account of Municipal Official's Interest
 in Construction Company—Milwaukee,
 Wis.—(legal decision) 81
—Direct Oxidation Process of Sewage Treat-
 ment, Allentown and Phillipsburg, N. J. 111
—Expansion Joint for Reinforced Concrete Pipe
 —New Jersey Sewage Works Association
 (pamphlet notice) 295
—Publications on 293
—St. Louis, Mo., Sewer Under Construction
 (photograph) 589
—Screens in Sewage Treatment Plants. 95
 Bridgeport, Conn. 245

Sidewalks

—Kokomo, Ind. 472

—Moving Sidewalks, Prize Contest for Design, Paris, France	281	—Regulation	
—Obstructions, Johnstown, Pa. (photograph) ..	325	Furnishing Lighting Service Beyond City Boundaries—Murray City, Utah—(legal decision)	291
Smoke Nuisance		Rates for Light and Power May Be Reduced by Agreement Between City and Company—Pulaski, Va.—(legal decision) ..	289
—Central Heating Reduces Smoke Nuisance, Chicago, Ill.	47	Street Railway Track Location Order Rescinded—Stamford, Conn.—(legal decision) ..	79
Social Service		—Service-at-Cost, Street Railways, Toledo, Ohio	566
—Bathing-Suit Inspector Requested, St. Petersburg, Fla.	281	—Tracks Must Be Removed on Expiration of Franchise—Detroit, Mich.—(legal decision) ..	509
—in Cincinnati, Ohio (pamphlet notice)	193	See also "Lighting," "Municipal Ownership"	
—City Mother, Los Angeles, Calif.	239	Waste Collection and Disposal	
—Community Chest, Cleveland, Ohio	452	—Ash Removal Ordinance Not Unjustly Discriminatory—Baltimore, Md.—(legal decision) ..	599
—Lodging-House, Municipal, New York, N. Y.	250	—Fly Breeding in Waste	109
—National Conference of Social Work (pamphlet notice)	399	—Garbage Collection	
State Bureaus of Municipalities		Dump-Wagon	97
—Pennsylvania	576	in Motor Trucks	
Street Cleaning, Oiling and Sprinkling		—Akron, Ohio	403
—California	244	—Dump Bodies	89
—New York City Street Cleaning in 1770	148	—Washington, D. C.	8
—Road-Oiler, Marion County, Ohio (photograph) ..	156	—Madill, Okla.	448
—Snow Removal		Water-Front Improvement	
Plow, Tractor-driven	205	—Seaside, Ore.	447
Road Machine as Snow-Plow, Great Bend and Salina, Kans.	87	Water-Supply and Water-Works	
—Sprinkling, Three Rivers, Que. (photograph) ..	364	—Advertising Water Service, Oakland, Calif.	11
—Street Sanitation Conference (pamphlet notice) ..	295	—American Water Works Association Convention, 1922	548
—Sweeper, Bayonne, N. J.	647	—Bacillus Welchii, Montclair, N. J. (pamphlet notice) ..	513
Street Lighting—See "Lighting"		—Cast Iron Feeder Mains, New Orleans, La.	467
Streets—See "Highways"		—Chlorine, Handling of Liquid	147
Surveys		—Cleaning Water-Mains	641
—Health, Lafayette, Ind. (pamphlet notice) ..	295	—Cleveland, Ohio, Baldwin-Fairmount Filtration Plant	381
—"Know Your Own City," Dubois, Pa. (pamphlet notice) ..	513	—Deep-Well Water-Supply, Montgomery, Ala.	466
—New Jersey Bench Marks (pamphlet notice) ..	513	—Diesel Engine in Light and Water Works	
—Social and Religious, St. Louis, Mo.	401	Amory, Miss.	529
—Topographical, in Relation to City Engineering, Flint, Mich.	118	Freeport, N. Y.	227
Swimming Pools—See "Baths"		—Drilled Wells, Increasing Flow from	501
Taxation—See "Finance"		—Electrolysis Investigation, Akron, Ohio	540
Traffic and Transportation		—Elevated Steel Tank, Portland, Ore.	431
—Bus Line Operation (pamphlet notice)	399	—Expansion Joint for Reinforced Concrete Pipes	443
—Chicago, Ill.		—Filters, Pressure, Standard Specifications ..	422
Devices for Traffic Control	583	—Financial Management of Water-Works. 417, 569	
Publication on	513	Greece	23
—in City Planning	458	—Iron-Removal Plant, Hightstown, N. J.	427
—Detours During Road Construction	454	—Lawton, Okla.	537
—Detroit, Mich., Bureau of Public Safety.	37	—Massachusetts (pamphlet notice)	633
—Lines Marked on Street for Safety Zones.	637	—Meter Box	407
—Motor-Cycle Policemen Not Subject to Regulations in Overtaking Speeders—Duluth, Minn.—(legal decision) ..	393	—Metering a Water-Supply at the Pumping Station, Camden, N. J.	121
—Mud and Ruts Strangle Knott County, Ky.	587	—Meters with Breakable Frost Bottom	303
—Road Improvement Affects Transportation (photographs) ..	49	—Meter Yoke	523
—St. Louis, Mo., Traffic Vigilantes	339	—Miami, Okla., Light, Power and Water Plant	139
—Sidewalks, Moving, Prize Contest for Design, Paris, France.	281	—New Jersey Water Resources (pamphlet notice) ..	295, 635
—Signaling for Traffic Control on City Streets ..	387, 643	—Prescott, Ariz.	311
—Street Railways		—Pumping Station, Hightstown, N. J.	427
Ashtabula, Ohio, Street Railway Question Settled	594	—Purification, Iowa (pamphlet notice)	293
Chicago's Traction Problem (pamphlet notice) ..	193	—Rates and Rate-Making. 223, 343, 417, 479, 569	
Motor Truck Equipment for Street Railway Maintenance Work, Detroit, Mich. (photograph) ..	589	Duluth, Minn.	362
Relocation of Tracks; Order Void in Absence of Public Need—Stamford, Conn.—(legal decision) ..	79	Gainesville, Fla.	421
Service-at-Cost, Toledo, Ohio	566	—Reservoirs	
Tracks Must Be Removed on Expiration of Franchise—Detroit, Mich.—(legal decision) ..	509	Arkansas City, Kans.	107
—Tally Machines for Counting Traffic, Connecticut	205	Decatur, Ill.	31
—Traffic Standards and Towers		Dubuque, Iowa, Covered Reservoir	317
Knoxville, Tenn.	568	Waterproofing Membrane for Reservoir, Nashville, Tenn.	413
La Grande, Ore.	33	—Shipping Water Samples (pamphlet notice) ..	285
New York City's Traffic Towers	71	—Softening of Water	299
Tree Planting—See "Forests"		—Stevens Point, Wis., Campaign for Plant.	369
Utilities, Public		—Supply Men Help Superintendents	424
—Assault upon Patron by Superintendent of Water-Works Department—City Liability—Durham, N. C.—(legal decision) ..	395	—Tapping Machine for Water-Mains	531
—Employee of Utility Company Cannot Hold Municipal Office—Kansas—(legal decision) ..	187	—Tests for Pure Water (pamphlet notice) ..	401
—Laying Pipes Before Paving		—Texas (pamphlet notice)	399
Kokomo, Ind.	470	—Warren, Ohio (pamphlet notice)	513
Prescott, Ariz.	310	—Waste Cut by Metering, Lawton, Okla.	538
—Newark, N. J., Chamber of Commerce Committee Report on (pamphlet notice) ..	85	—Well Screens to Protect Pumps	517
		—Wheeling, W. Va., Water-Works Bond Campaign	592
		—Wyandotte, Mich., Water-Supply Advertised ..	63
		Weights and Measures	
		—Bread Weight Law, Los Angeles, Calif.	318
		—Publication on	513
		Women's Civic Work	
		—Mayors	543
		—Why Women Are in Politics	536
		Zoning—See "City Planning"	

Volume

XXVI

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Reinforcing Gravel Roads for Motor Traffic

The Bituminous Gravel Roads of Hanover, Mass., Have Proved Economical Under Severe Service

By **Harrison L. House**

Civil Engineer, Hanover, Mass.

VERY soon after the coming of motor vehicles, it became apparent that Hanover must make a change in the construction and maintenance of its public highways. Up to that time we had a very good system of gravel roads and kept them for the most part in good condition. With the increased use and changed conditions brought about by automobiles, the roads went from bad to worse, until they were in a very serious condition.

In 1915, about 650 feet of road, an exceptionally bad piece over clay bottom with

water standing in the gutters at all seasons of the year, was rebuilt. This section of road was broken up with a steam roller, and the old road was excavated to a depth of about 6 inches and carted away. A drain 1½ feet wide and about 3 feet deep was dug on either side. This drained into a brook which crossed the road. These ditches were filled with stones 4 to 6 inches in diameter, and the whole width of the roadway was subgraded to a true and even grade and covered 8 inches in depth with field stone of not over 6 inches in diameter. It



THE WELL-PRESERVED GRAVEL ROAD AT THE SQUARE, WEST HANOVER, MASS.



TREATED GRAVEL ROADS NEAR THE LIBRARY, WEST HANOVER, MASS.

was then covered with a good gravel about 5 inches in thickness, the stone foundation and gravel being thoroughly rolled with the steam roller. A road oil was applied to the surface at the rate of $\frac{3}{4}$ -gallon per square yard, and sanded thoroughly, and the next season Tarvia B was applied, and now the road stands up under heavy travel without showing any weakness.

In 1916 a contract was let for the construction of $8\frac{1}{2}$ miles of gravel road, using the same binder at the rate of $\frac{3}{4}$ -gallon to the square yard. The town, with its own men, built about $4\frac{1}{4}$ miles of the same kind of road in 1916, and each year since has built more or less, until there are now 16.1 miles of this kind of road. In building these roads we first pick up the road with the steam roller and then form the subgrade with a road machine and roll it with the steam roller, removing the large stones and any poor material. Where the soil is spongy or clayey, we have put in a stone foundation from 6 to 8 inches in thickness. Of the 16.1 miles, about one-fifth has been built with the stone foundation. The gravel used is put through the stone crusher. On the whole, this has been found satisfactory, but to keep the material well mixed, care must be taken. In the later work the larger stones were taken from the gravel, crushed and applied separately.

The roads are made 24 feet in width between gutters, and Tarvia B applied 18 feet in width in the center, except around the curves, where it is increased to about 21 feet. The binder is applied in three coats of $\frac{1}{4}$ -gallon to the square yard, and the last coat is well sanded with coarse, sharp sand. The stone foundation is made only 15 feet

in width in the center of the roadway, with blind drains 20 to 30 feet apart opening alternately on either side of the road to drain the foundation. It has been found that where the grade is nearly level, these blind drains are a great help in keeping the road-bed dry. They have been placed from 30 to 40 feet apart, extending from the middle of the road-bed to the gutters and opening alternately on opposite sides of the road.

It is essential to have good drainage and also to use gravel enough to make a solid road-bed that will carry the load. We have used from 3 to 6 inches, depending on the character of the foundation soil and the amount of gravel in the old road-bed. The road has been thoroughly rolled with the steam roller to compact it before applying the binder.

After completion, any weak spots that show up from use are carefully mended with pea-stone and cold patch material. Each year a surface coat of the binder has been applied where needed, at the rate of $\frac{1}{4}$ -gallon to the square yard, and covered with coarse, sharp sand.

From 1915 to March 1, 1921, the town has expended \$66,875—or about \$4,154 per mile—for construction and maintenance of its 16.1 miles of road. Practically all of this road is now in first-class condition and sustaining a heavy and increasing traffic. It is felt that we have gone a long way toward solving the problem of furnishing good roads for the town at a price that any small town can afford to pay for an all-year-round road.

Last year snow was removed from the streets so that automobiles and trucks could be used at all times.

The Adequate and Attractive Lighting of City Streets

Part II

By L. A. S. Wood

Classification of Streets for Ornamental Lighting

IN many of the larger cities will be found some exceptionally wide and important streets which will require special treatment; in general, however, for the purpose of determining the correct size of lamp with the best spacing and mounting height, the streets may be divided into three classes: (1) important business streets, (2) side streets, and (3) residence streets. The following table gives approximate data on this subject, which, however, may be varied to meet local requirements:

TYPE OF STREET	Size of Lamp in Lumens*	Spacing in Feet	Mounting Height in Feet
Important business	6,000 to 15,000	50 to 75	12.5 to 15
Side	2,500 to 4,000	75 to 100	11.5 to 13.5
Residence	1,000 to 2,500	150 to 250	10.6

* A lumen is equal to ten times the candle-power rating.

In the important business streets and side streets, the ornamental posts should be set symmetrically opposite each other on either side of the street, while in residence districts the posts should be staggered.

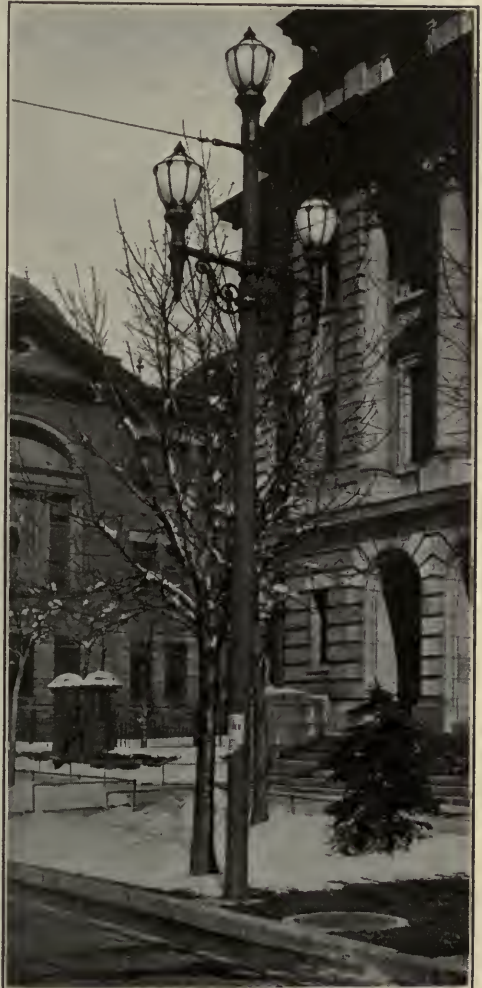
For exceptionally wide and important streets, a greater intensity of illumination is required, with higher mounting, and, for this purpose, two-light ornamental posts, for use with 15,000 and 25,000 lumen lamps, have been developed.

The Use of Trolley Poles as Lighting Units

On streets where trolley poles are in service, the best method of lighting is by the use of ornamental trolley brackets with suitable lighting units, either with single or double arm, which may be attached to the trolley poles, presenting a very attractive appearance and eliminating the necessity of cluttering up the streets with additional posts.

Another method of adapting trolley poles as ornamental lighting units is to encase the pole in an ornamental cast iron shell

with ornamental brackets attached. An attractive unit has been designed with double brackets immediately below the trolley span wire and a single light at the top. The span wire is attached to the trolley pole through a hole provided in the capital of the top lighting unit.



A COMBINATION LIGHT STANDARD AND TROLLEY-WIRE SUPPORT USED IN SALT LAKE CITY, UTAH

Types of Commercialized Ornamental Posts

Ornamental posts may be divided into three classes: cast iron, concrete, and pressed steel.

The earliest ornamental cast iron post the history of which is preserved was installed in the Taj Mahal, Delhi, India, upwards of 1,600 years ago, and stands to-day a monument to the durability and lasting qualities of cast iron. Cast iron posts will not corrode, neither will they chip or crack under extremes of temperature. They are designed to withstand severe shocks, such as might be received in ordinary street traffic, and present the slender and graceful appearance so desirable in ornamental street lighting units.

Concrete is one of the most durable materials used in construction work, but it has been found that ornamental posts of this type must be of very heavy and substantial construction to withstand extremes of temperature. Unless manufactured with the greatest care, concrete posts may chip and crack in northern climates.

Pressed steel posts generally consist of a shaft of corrugated pressed steel, mounted on a cast iron foundation, with an iron capital, the whole bolted together with three tie rods passing through the center of the shaft.

The Mazda "C" Lamp

Until about the year 1913, the filaments of all commercial electric incandescent lamps were operated in bulbs from which practically all the air and gases had been removed. The evacuation of the bulb accomplished two purposes, viz., it prevented the filament from being consumed by the oxygen of the air and also prevented the loss of heat by convection. As the temperature of the filament is raised, the light emitted increases much more rapidly than the energy consumed, but, on the other hand, the rate of evaporation of the filament is increased.

In the Mazda "C" lamp, the rate of evaporation is reduced by the introduction of inert gases into the bulb, thus permitting the use of a higher operating temperature. Convection losses are reduced by the use of a concentrated type of filament, and this renders the use of the Mazda "C" lamp especially suitable for street lighting purposes.

Constant-Current Series Circuits

Alternating-current series arc lamps were operated on circuits of either 6.6 or 7.5 amperes and, in consequence, series lighting regulating equipment designed for these ratings became standardized throughout the country. Series incandescent lamps were made for use on these circuits in ranges of from 60 to 1,000 candle-power, but the larger size lamps did not come into commercial use until the high-efficiency Mazda "C" lamps, operating at 15 and 20 amperes, were introduced. These lamps, owing to the increased size and rugged construction of the filament, have a longer lamp life than the straight series type and are generally adopted for ornamental street lighting systems, except in residence districts.

Since the standard rating of series alternating-current circuits is either 6.6 or 7.5 amperes, individual auto transformers to step up from the line current to that required by the lamp have been designed, and these are generally mounted in the post top, immediately below the socket. In cases where a safety coil is installed in the base of the post, the auto transformer is omitted and the safety coil serves as the step-up transformer.

The Light Unit

The problem of street lighting is not like that of lighting a room where the ceiling and walls reflect the undirected light, and provision should be made in the lighting units to direct the light emitted above the horizontal to the plane of illumination. With ornamental post lighting, however, it is desirable that a small amount of light from the upper hemisphere should be directed against the fronts of adjacent buildings, and that glare should be, as far as possible, eliminated.

Glare, within the range of vision of the pedestrian or vehicle driver, should always be avoided. It causes the pupil of the eye to contract in an effort to protect the delicate mechanism of the retina, preventing the observer from seeing as well as he would be able to do with a light source of lower intensity, but more perfect diffusion. We are conscious of this phenomenon when entering a moving-picture theater from a street flooded with sunlight; at first no details can be seen, but gradually, when the



MODERN RESIDENTIAL AND PARK LIGHTING STANDARDS IN USE IN VINCENNES, IND.

eye becomes accustomed to the light, or, in other words, when the pupil becomes dilated, permitting more light to enter the eye, the interior details become visible.

The problem of designing lighting units of high intensity, with a minimum of glare, has been solved by specially designed posts which distribute a flood of light on the streets, with a small amount upwards to il-

luminate the fronts of adjacent buildings. These units have been developed for "Super White Way" lighting, with 10,000- and 25,000-lumen lamps, and they may be used with smaller lamps, if desired.

With the variety of ornamental street lighting fixtures now available, the possibilities of efficient and artistic city lighting are unlimited.

Norwich University Organizes Bureau of Municipal Affairs

Norwich University, Northfield, Vt., has established within the Department of Political Science a Bureau of Municipal Affairs, which will hold itself ready to give assistance to the counties, cities, towns and villages of Vermont in the solution of problems peculiar to municipal corporations.

The Bureau will render this service in the following ways: by giving information upon request regarding community organization, town planning, and the administration of

local government; by publishing and distributing bulletins dealing with problems of government; by encouraging the establishment of local town reference bureaus; by providing communities with speakers on governmental topics; and by holding local government conferences.

K. R. B. Flint, Professor of Political Science, will be director of the Bureau, and to him should be addressed all communications.

Translation of a Notice Printed in French and Flemish and Posted in Many of the Public Parks and Squares of Brussels

"The trees give us shade as the plants and flowers give us the joy and the beauty of the country. To break or destroy trees and plants is to do damage to oneself."

With such an appeal, is it any wonder that the people of Brussels, old and young, respect the natural beauties of their parks and squares?

—STEPHEN CHILD, Fellow American Society of Landscape Architects.

Long-lived Brick Pavements

Pavements Over 100 Years Old in Use in Holland

THE United States is accustomed to brick pavements which have endured over a generation in service and which still continue to bear traffic economically. Carbondale, Pa., has one 32 years old; Alliance, Ohio, 31 years old; Sedalia, Mo., 29 years of age; Olean, N. Y., 25 years. These are typical instances of longevity.

The first brick pavement of record in this country was laid about 1870 at Charleston, W. Va., and it lasted for many years. In those days paving brick as such were not manufactured, and the Charleston pavement was made of vitrified brick originally made for other construction. But they demonstrated the feasibility of brick pavements, and the brick pavements of to-day in our country have their origin in this beginning.

The United States was not the first country in modern times to lay brick pavements, despite its brick-paving history of more than a half-century. For instance, Holland's experience with brick pavements goes back to the time of Napoleon. In Holland, as in the United States, the brick used were vitrified, as are paving brick to-day.

Although no scientific work deals with pavements as they were developed there, several popular authors on travel discuss these pavements in their works.

B. E. Stevenson, in his "Spell of Holland," says:

"For brick, brick, brick are everywhere—overhead and underfoot, on edge in the roadway and piled into great walls and massive towers. It would almost seem that the Dutch had dug away most of the ground beneath their feet in order to convert it into paving and building materials."

William Elliot Griffis, in "Brave Little Holland and What She Has Taught Us," writes:

"After the Romans left and the barbarians triumphed, brick-making became one of the lost arts. In the Rhine delta, the Dutch revived the art of moulding clay into oblong forms and baking them into stone. Their material lay at hand in the rich beds deposited during centuries in the sluggish river bottoms. They made brick houses, walls, pavements and road-beds.

"So hard are the Dutch bricks burned that the common name is 'Klinker.' Many of them have defied the teeth of time for ages."

First-hand information on how the Dutch made their paving brick, with technical data which might tell the secret of the wearing qualities of their brick pavements, has only recently been secured. William C. Koch, Vice-President and General Manager of the Twin City Brick Company, of St. Paul, passes the story along from his father, who manufactured brick in Holland many years ago.

The paving brick with which the old



A BRICK ROAD IN HOLLAND IN USE OVER 100 YEARS

roads were built was made of surface river-clay, sanded and close set in up-draft kilns with permanent side-walls and large arches underneath for the burning of peat. The brick were brought to the vitrification point in the center and heated to a degree which made them so soft that the openings between them as set were completely filled in. The brick retained their shape by mutual support, and their separation was possible only because of the sand which was used in setting them.

The type of brick proved to be very good paving material, and paving was done at a very low cost, not to be compared with that

of American brick paved roads involving foundations, fillers, etc.

In the burning there is produced about 20 to 40 per cent of pavers, 20 to 30 per cent of semi-vitrified clinkers, 20 per cent face brick carefully selected as to color, and the remainder discolored hard and soft commons.

Some of the brick roads are 200 years old. This type of road in Holland was begun in sandy-soil districts where traffic on the natural soil was otherwise impossible. A large number of these roads built during Napoleon's time are still in existence and in good condition.

This Lantern Will Not Blow Over

By Albert Marple

MUNICIPAL officials or employees of public service corporations who have had any experience with street or highway work, or with any other work that requires the placing of lanterns at night, realize that it is quite a job at times to keep the lanterns from tipping. Very often the workman whose duty it is to place the lanterns in positions in which they will warn pedestrians and motorists of danger points may do his work faithfully, but that is no assurance that the lanterns will stay upright throughout the night. A strong wind may arise that will tip one or more of them over, extinguishing the light and leaving conditions right for a damage suit against the municipality or company that is doing the improvement work.

The danger of trouble from this source is greatly minimized by the adoption of the idea shown in the accompanying illustration. This consists of the use of a small concrete block, in which has been embedded the bottom or oil reservoir of the lantern. The concrete block makes the lantern practically untippable.

To make the block, a form of lumber 8 inches square and about 4 inches deep is made. A portion of the concrete is placed in the bottom of the form, and upon this, in the center, the lantern is placed, care being taken to see that the oil filler cap is above the top of the form. The remainder of the form is filled with concrete, completely

covering the oil reservoir as high as desired. It should be made sure, however, that the oil cap and the thumb screw by which the wick is raised are readily accessible.



THIS LANTERN STAYS UPRIGHT—AND IS INCONVENIENT TO STEAL

The Economy of Garbage Equipment in Washington, D. C.

A Heavy-Duty Motor Truck with Special Body and Sectional Lids Meets All Requirements

THE City Refuse Division of the District of Columbia put into operation in July, 1921, a heavy-duty dump truck which in its first 3½ months traveled 3,250 miles and hauled about 1,575 tons of garbage. An accurate record has been kept of the gasoline and oil used, and, considering that the truck engine is running practically all the time because of the large number of stops required, the miles per gallon has been very satisfactory, according to J. D. Murray, Master Mechanic of the Division.

The sanitary body of the truck is made entirely of steel and is water-tight. It is equipped with sectional hinged lids which are close-fitting and which make it unnecessary to expose more than a small space when



DUMP TRUCK SHOWING SECTIONS WITH COVERS RAISED

loading the truck along the street. The body is fitted with a running-board, so that the operators can readily load from the top. The running-boards are arranged to fold up against the side of the body when not in use. The truck has a capacity of 200 cubic feet, or 5 tons. The inside dimensions of the body are: length, 138 inches; width, 78 inches; height, 24 inches at the sides and 16½ inches from the top of the side to the peak of the triangle.

This Autocar garbage truck in ordinary use carries three men in addition to the driver, and it is filled to capacity several times each day. It operates principally around the market and in the rear of big hotels, boarding-houses and other places from which large amounts of garbage must be removed daily.



GARBAGE COLLECTION TRUCK IN DUMPING POSITION

What Is a Road Survey?

Various Types and Definitions Used by the Layman and the Engineer

THE term "road survey" as commonly used by the public includes almost anything from a trip on horseback over a road, to the most exact measurements for the location of a costly bridge. The State Highway Commission of South Carolina has outlined this subject in an interesting manner in its report for the year ending December 31, 1920, from which the following material has been prepared.

Surveys may be divided into three classes on the basis of amount of detail necessary, namely: surveys for roads constructed without Federal Aid; surveys for Federal Aid roads; and surveys for large bridge projects. The ultimate aim is the same, however, in all—the securing of the most serviceable, and at the same time the most economical, location or site.

Even the simplest road survey involves consideration for: the probable future kind and volume of traffic; the probable future development of the adjacent land, such as its being drained by dredging or filling-in to provide building sites; the type of surfacing to be used at present and that likely to be required later; the proper provision for handling both the surface water and the subdrainage; the connections with other roads; proper grades to join with existing bridges that are to remain in place; the car tracks, water-mains, sewers, etc., that may be encountered; the elimination of railroad grade crossings; the avoidance of dangerous curves and excessive grades; and last, but not least important, the cost of construction. Not only are the factors enumerated of value within themselves, but several of them also affect the cost of future maintenance of the road. Besides all these things, the engineer must consider the conveniences and, oftentimes, the whims of the property owners along the road. There is frequently great temptation to follow the line of least resistance, usually an old, crooked, badly washed road, rather than antagonize a landowner.

After going over the route to be surveyed, trying to balance properly the aforementioned factors, the actual staking out, or "survey," is begun. Stakes must be set at each 100 feet, and additional stakes at

humps or noticeable depressions, on the banks of ditches and streams, etc. The curves must be figured and the stakes set on what will be the center line of the finished road, so that the amount of earth to be removed can be figured. The position of property lines, near-by houses, railroad tracks, fences, canals, streams, telephone and telegraph poles, woods, etc., must be noted and sufficient measurements taken to enable such objects to be shown properly on the plans. Certain of these stakes are "referenced"; that is, their distances are measured from various permanent objects, so that when the road is being built the original lines as surveyed can be found if the stakes have been misplaced.

After these stakes have been set, it is necessary to run levels and cross-sections so as to show elevations, not only of the ground along the center line of the proposed road, but also of the ground on either side for a distance of at least 25 feet. If the survey follows an old road with deep ditches and high banks, it becomes necessary to take a great many elevations in order to be able to compute the amount of earth moved in grading.

Since an error in these levels at one place might affect all the road beyond that point and cause an error of many hundreds of yards in computing the amount of grading, or cause the construction of a bridge too low or higher than required, it is necessary to check the levels. This is usually done by running another independent line of levels called "bench levels," which check against the profile levels at numerous points, in much the same way as one checks an adding machine slip against the original column of figures. This is the reason that a survey party must go over the line a second or third time.

A single survey party is usually composed of three men sent out by the Department and two furnished by the county. The chief-of-party studies the route, selects the location, sees that the party sets the stakes at proper points, checks the calculations and notes made by the instrument men, makes recommendations as to proper sizes and locations of culverts and bridges, makes a

daily report to the office of the Department, and arranges for board, lodging and transportation for the party. His object is to secure the best route feasible, giving due regard to the factors indicated above. In

difficult situations and in cases of protest by property owners he calls upon the chief-of-surveys, who in turn takes up with the State Highway Engineer such matters as cannot be adjusted in the field.

Municipal Tax Exemption Stimulates Home Building

FIGURES for the first seven months of tax exemption in New York demonstrate the efficacy of this plan for stimulating home building.

The Special Housing Session of the State Legislature in September, 1920, passed an act permitting municipalities to grant such exemption for dwellings, except hotels, from April, 1922, to April, 1932. Such dwellings must have been completed after April 1, 1920, or begun not later than April 1, 1922. Although strong arguments for the law had been advanced before the Legislature, only a few municipalities showed their appreciation of its advantages by passing the necessary local ordinances. They were Malone, Beacon, Saratoga Springs, Plattsburgh, Little Falls, and New York. In an address before the joint meeting of the National Municipal League and the American Civic Association, Raymond V. Ingersoll, Secretary of the City Club of New York, gave the following important information:

Effect on Building

Most of the up-state municipalities where this experiment has been tried report that home building has been noticeably stimulated. In New York City the results have been specially marked, and this in spite of unfavorable labor and mortgage conditions. Lawson Purdy, formerly President of the National Municipal League and a leading New York authority both on housing and on taxation, says:

"In seven months houses have been planned to accommodate over 38,000 families. If this rate of progress continues, 260,000 persons will be provided for in a year. This is about three times the rate of growth of the city."

The present rate of building is more than four times that of last year.

Of the provisions for 38,000 families already referred to, 22,704 are in one- and two-family houses, which represents a com-

plete reversal of the old ratios of such houses to tenement apartments.

Figures taken from the *Real Estate Record and Guide* of November 5, giving the valuations of contracts actually awarded, show that, whereas in 1920 the aggregate for new business buildings exceeded by more than 25 per cent the total for residential buildings, in 1921 the total for residences has been more than three times as great as the total for business purposes. As against housing contracts awarded for the entire twelve months of last year, amounting to \$81,650,200, we have contracts during ten months of this year—including only seven months under tax exemption—amounting to \$195,933,400. That the pace has been accelerating is made evident by the fact that in October alone housing contracts were made aggregating \$41,265,400. The figures for floor space are still more impressive. For the year 1920 the total contracted for was 15,142,000 square feet. For the first ten months of 1921 it was 41,638,800 square feet.

Effect on Vacant Lots

One of the incidental results of the exemption has been a very great activity in the sale of vacant lots. Most of these lots are reasonably near the rapid transit lines. A year ago there was no market for them, but now they are being auctioned off by the thousands at moderate prices. Where formerly the chief selling point featured by the agents was the possibility of profits through a rise in land values, now the advantage advertised is the opportunity to build a home and to secure the exemption. An unusually large proportion of the new houses now being built are for occupancy by the owners. Thousands are seeking escape from the tenements. From a social point of view it is the healthiest movement in housing that has taken place in New York City in some years.

Water, Water Everywhere—Yet It Can Be Advertised

Newspaper Campaign Keeps Public Sold on Service Received, Even When Rates Are Raised

By Hugh E. Agnew

D ID you ever see water advertised? Not seltzer water, or any of the medicinal waters, or mineral water for bathing, or even fresh spring drinking water, but just plain H₂O for use in the bathtub, to wet down the lawn and wash the flivver? These campaigns are unusual and infrequent, but they have occurred. A few have not been mere "Notices," but well-arranged, extensive campaigns. Besides showing another instance of the almost unlimited application of advertising, one of the latest of these campaigns is particularly suggestive of advertising possibilities for those whose product is in the nature of a monopoly.

The East Bay Water Company of Oakland, Calif., which furnishes the water-supply for that city and for Berkeley, Alameda, Piedmont and Richmond, comprising a population of more than 300,000 people, was the advertiser. It was a newspaper campaign in which the daily papers of San Francisco and the cities named were used from May, 1919, to January, 1921.


The first messages pertained to the saving of water in the house—in which there was a double purpose. It was a subject which would get the immediate attention and sympathy of the women. Then, it followed an exceptionally dry period, in which

the supply of water had been inadequate because of shortage at the source. During the summer of 1918 the use of water for lawns was prohibited in the "East Bay cities," as the municipalities on the east side of San Francisco Bay are called, and the water company could easily interest residents in that subject, as all were anxious to prevent another shortage.

The campaign opened with a full page showing a stream of "domestic" and "industrial" water pouring from a main. The title in large, black, hand-lettered type was just "Water." "When a group of people having a common interest live in the same place under the same laws and regulations," it read, "these people constitute a community. Whenever a community exists, community problems arise. These community problems explain and account for the public service corporations — companies organized to render service essential to the general public health, or convenience, or both; in other

words, companies organized to solve community problems. The most important of these is the question of an adequate water-supply." Then followed a brief statement of some of the topics that would be discussed in the series of advertisements which were to follow.

Number Two of a Series



- Why we ask you not to waste water

Is it because we are afraid of a shortage of water?

No. This year's rain has filled the reservoirs with enough water to insure an adequate supply for at least ten years.

Is it because we lose when you waste water?

No. You pay us for every drop of water registered by your meter, whether used or wasted. As a matter of fact, the more you waste, the more we gain.

Then why, you ask, do we urge you to save water?

Because in addition to water—we sell service. Part of this service is to give you full value—to help you pay only for what you use and to use all that you pay for.

In this series of advertisements we will show you where to watch for leaks and how to perform household duties without water waste.

If our suggestions are followed, consumers will only pay for water used—not wasted—and will become our greatest asset—satisfied customers.

**East Bay
Water
Co.**

DOMESTIC INDUSTRIAL

**THIS KIND OF ADVERTISEMENT
CREATES GOOD-WILL BY HELPING
CUSTOMERS "USE ALL THE WATER
THEY PAY FOR"**

Selling Water Economy

The first of these was wastage of water in the home. The water company assured its readers that this was urged, not because of fear of another shortage, but "because in addition to water we sell service. Part of this service is to give you full value—to help you pay only for what you use and to use all that you pay for."

Various means of preventing waste were discussed, such as leaks in taps, using running water for rinsing potatoes while peeling them, allowing children to play with the hose, etc. Each formed the subject for one message. By the time this series was completed the summer was nearly over and people had ceased to think much about water shortage. Also many who had taken occasion to complain about the size of their water bills had discovered various means of reducing them. If they did not care to take the trouble to prevent waste, they had that guilty feeling which prevented complaint, either at the office or to neighbors.

The next phase of the campaign was devoted to the general subject of making the water-supply clean, safe, pleasing to the taste and to the eye, and free from all impurities. This series included a discussion of collecting or "warehousing" the water. Pictures of the various reservoirs were given and means of protecting the source described.

That iron water-mains cost \$8 a foot, that running water usually does not "purify itself," but tends to collect impurities as it flows, how watersheds are guarded and wooded, the duties of the patrol, and a map of the thirty-five square miles owned or controlled by the company for collecting water, were some of the subjects discussed in the second period of the campaign.

Being a public utility, it was the purpose of the company to keep the public sold as thoroughly as possible upon the service which the company gave. An important part of that was to explain as fully as possible the nature and extent of the service of supplying water.

There are always a lot of agitators whose chief sport—both indoors and out—is to attack public service corporations. The fullest possible understanding of the business of furnishing a public service to a city will probably do more than any other one thing to forestall dissatisfaction that might be created by these agitators.

The amount invested in the watersheds and why that investment influenced water rates were explained as part of the general understanding of the water business. The difficulty and expense of elevating 2,000,000 gallons of water 800 feet daily, which is done at Alvarado and Lake Chabot, was graphically illustrated. The difficulty of repairing and replacing broken water-mains quickly was pictured.

The elaborate and expensive measures taken to keep the water pure and healthful were explained in another series, one of which discussed water analysis and how in addition to the company's own laboratories both the city and the state health departments made analyses. The little algæ which were sometimes found in the water as it came from water taps were shown to be harmless, being a vegetable which grows so rapidly that it "can be seen with the naked eye within forty-eight hours." Filtration was explained. Also the Government report, which gave Oakland the lowest percentage of sickness from typhoid of any city in the country, was featured in the advertising copy. The care with which the water-supply was handled was given its full share of credit in the advertising, as infected drinking water is the most common source of typhoid contagion. The chlorine process of sterilizing the city water was so described that any child could understand it.

Another step in this campaign to keep customers sold on the service they were receiving was a detailed discussion of the company's method of supervision. Why the water company is under the jurisdiction of the State Railroad Commission was the subject for an advertisement, two columns thirteen inches. The similarities of the railway and the water-supplying business were pictured, and the public service idea was illustrated in a number of other advertisements of generous space.

The various units of the water company's plant were discussed in the series on supervision, and reasons given for the particular construction. The saving effected by a water tunnel from the San Pablo reservoir to the filter plant in the Berkeley Hills was the subject of another message. How the company was looking ahead to the development of the beautiful residence district north and east of Lake Merritt indicated its far-seeing alertness in providing for the city's growth. The water company did not

want its customers to think it short-sighted, so it frankly discussed in detail this and other improvements and additions. It called attention to the difficulty of furnishing water to the homes in the hill districts hundreds of feet above the bay.

Economies in meter reading, the cost of collecting bills, the saving effected by modern office equipment, were all adequately presented. The water company—it was evident from its advertising—was an enterprising, well-managed institution, of which its customers might well be proud.

Creating a Friendly Feeling

Of course the copy was too adroitly written to mention such a thing, even indirectly, but when a customer knew the business so intimately, as all must have known it after following its advertising for eighteen months, he would almost inevitably have a feeling of friendly sympathy for an institution which was trying so hard to please—rather than a hostile, critical attitude which is so commonly felt toward the privately owned public service corporations.

Finally, to round out the campaign and add the human touch, the work of various employes was described, the employe named, and the length of time he had been engaged in keeping the city's water-supply adequate was given. "An hour-and-a-half shut-down in two years," the reader was told, "was the record made during the water crisis of 1918, by Charles H. Harry, in charge of the seventy-eight wells of the Fitchburg pumping station."

With the prices of everything else going up, it was only natural that people would have to pay more—slightly more—for the important service of having their water needs supplied. The increase in the cost of water was but 12 per cent. Other commodity prices had increased 98 per cent. It was evident that the water company had again shown its skill in management to keep down the increase to so little as 12 per cent. That was an added reason for pride in the concern—rather than criticism of it and a grudging consent to the added cost.

The space used was liberal, from two-column-ten to full page. The form of the display changed from time to time, as well as the subject matter. That was to avoid monotony. The signature, however, formed a sort of connecting link between the different numbers of the series. It was hand-

[No. 187 Twenty-eight of a Series]



Algae is harmless

Algae is pronounced "Al-gee." It is not a boy's name; and it is not bacteria.

Algae is a vegetable growth. It forms in reservoirs, lakes, and streams, and grows large enough within forty-eight hours to be seen with the naked eye.

If particles of Algae should pass through the mains from the distributing reservoirs into your drinking water and taste rather suspiciously; if it looks a bit doubtful, remember it is not harmful. It is a vegetable growth, purely.

As harmless as Algae may be, it is still unpleasant to some, and this company is now covering its distributing reservoirs to keep the sun's rays from the water. Thus protected, stored water will be free from Algae.

Covering our large reservoirs is rather a costly undertaking, but you are entitled to drink water without little mental photographs of doubtful character—so we're putting the "lid" on the reservoirs, keeping the sun out and stopping the formation of Algae.

**East Bay
Water
Co.**

DOMESTIC INDUSTRIAL

MOST CONSUMERS WHO READ THIS ADVERTISEMENT NEVER SAW THE ALGAE, BUT THEY WERE PREPARED FOR SUCH AN INCIDENT. IT KEPT THE CUSTOMER SOLD ON SERVICE

lettered and of the same type style as that of the word "Water" in the first announcement. As the incorporation is known locally as the "Water Company," the display of the signature was so arranged as to emphasize that part of the name.

The general effect of the advertising, as expressed by a prominent real estate man of the district, has been to create so much goodwill for the water company that no agitator or intriguing politician could stampede the public into forcing an issue with the East Bay Water Company.

ACKNOWLEDGMENT.—Reprinted by courtesy of *Printers' Ink*.

**"Sharp Turns"
By James W. Brooks**

The people themselves can do much towards keeping highways clear of graft by tearing up political weeds along roads in their own neighborhood.

Using the road to pay political debts makes a rotten subgrade in the public mind for further highway development.

—American Highway Educational Bureau.

Our Dangerous Schoolhouses

The Fire Losses in Schools and the Existing Fire Peril

WITH the great publicity that has been given to the fire peril existing in the New York City schools, considerable attention is being directed towards the dangers to which school children are subjected through laxity in observing fire department regulations in many cities. The New York report covers conditions as presented by the Meyer Legislative Committee and states that of the 695 schools in the five boroughs, 496 have violations of fire department regulations filed against them, although some of the violations doubtless were of a minor nature. In the course of this period, over 50 fires occurred in the school buildings, and thousands of lives were jeopardized. Fire drills are credited with having prevented any fatalities.

Unfortunately, the situation in New York City is not exceptional. Many educational structures throughout the country are in a deplorable condition. One authority has stated that "over 90 per cent of our school buildings are potential death traps," the

opinion referring to national conditions. Fortunately, there is evidence from time to time of local awakening.

The Chamber of Commerce of Holyoke, Mass., for example, recently took steps to bring about the installation of sprinkler systems in the city schools as a measure of safety.

Statistics compiled by the National Board of Fire Underwriters through its Actuarial Bureau show that there are, on the average, day in and day out through the year, about 5 school fires, which, of course, are of varying degrees of seriousness. Recorded schoolhouse losses in the United States during the four years of 1916 to 1919, inclusive, amounted to \$19,846,038. This figure, however, covers only property on which losses were paid by members of the Actuarial Bureau of the National Board of Fire Underwriters, and if 25 per cent be added to it to allow for unreported fires and those in uninsured structures, the total would very nearly reach

FIRE LOSSES IN SCHOOLS Including Those in Universities, Boarding Schools, Convent Schools and Academies STRICTLY PREVENTABLE CAUSES

Causes	1919 Losses	1918 Losses	1917 Losses	1916 Losses
Defective chimneys and flues.....	\$556,427	\$353,851	\$301,365	\$430,370
Fireworks, firecrackers, etc.....	18,986	36	31,455	.....
Gas, natural and artificial.....	33,659	36,166	28,987	65,292
Hot ashes and coals, open fires.....	77,391	63,579	37,501	32,277
Ignition of hot grease, oil, tar, wax, etc.	980	1,259	70	261
Matches—smoking	197,061	250,408	259,287	204,726
Open lights	396,561	10,423	8,454	49,414
Petroleum and its products.....	85,032	26,552	14,633	118,235
Rubbish and litter	2,871	19,328	33,937	22,350
Sparks on roofs	316,588	265,909	239,046	133,091
Steam and hot water pipes.....	14,529	50	1,008	25
Stoves, furnaces, boilers and their pipes	523,469	645,595	645,725	464,814
Total	\$2,228,464	\$1,673,156	\$1,601,468	\$1,520,855

PARTLY PREVENTABLE CAUSES

Electricity	\$472,853	\$559,068	\$506,632	\$585,054
Explosions	35,094	5,890	76	2,469
Exposure (including conflagrations)....	117,260	488,659	156,877	268,573
Sparks from machinery (friction).....	51,751	6,952	110	6
Incendiarism	162,735	180,663	32,737	428,364
Lightning	78,643	193,225	199,789	61,811
Miscellaneous known causes.....	57,652	135,090	78,768	85,050
Sparks from combustion.....	14,258	3,829	37,865	4,708
Spontaneous combustion	165,147	302,769	335,180	449,697
Total	\$1,155,393	\$1,876,145	\$1,342,974	\$1,885,732
Unknown (probably largely preventable)	2,494,788	2,026,840	1,114,120	931,103
Grand total	\$5,873,645	\$5,576,141	\$4,058,562	\$4,337,690

\$25,000,000, all of which represents wasted labor and material. Furthermore, these fires endanger thousands of young lives.

It will be observed from these statistics that the loss of \$5,873,645 in 1919 was the largest in the four years, and that only in one period, 1917, was a decrease from the preceding twelve months shown.

There was a considerable increase in 1919 in the destruction due to defective chimneys and flues, fireworks, firecrackers, and open lights as compared with 1918. Electricity losses, however, displayed some improvement, and the same was true of those resulting from exposure, lightning and spontaneous combustion. The heaviest damage in 1919, \$556,427, was charged against defective chimneys and flues, whereas in 1918 stoves, furnaces, boilers and their pipes held first place. It is evident from the tabulation just below that the heating plant as a whole is the chief hazard in schools.

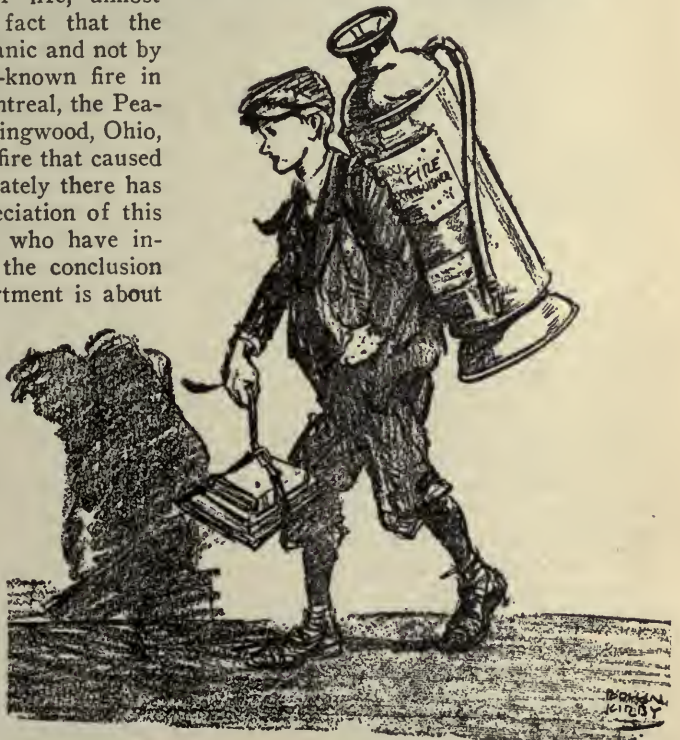
How Some Schools Are Well Protected

Investigation of school fires where there was a considerable loss of life, almost universally uncovered the fact that the tragedy was occasioned by panic and not by the fire itself. In the well-known fire in the Hochagela School in Montreal, the Peabody, Mass., fire and the Collingwood, Ohio, fire it was panic rather than fire that caused the appalling loss of life. Lately there has been a more universal appreciation of this fact, and school authorities who have investigated it have come to the conclusion that the organized fire department is about the only effective means of handling panic and preventing extensive loss of life. Many cities throughout the country have for this reason installed fire alarm boxes in every school, so that firemen may be called at once.

It is, of course, impractical to tear down 80 per cent of the schools of the country and immediately erect in their places modern fire-proof buildings. There are, however, certain steps which can be taken to make school-houses safer, one of which

is the all-important installation of a fire alarm box on or within every schoolhouse in the country. Following is an honor roll of cities in which every schoolhouse is protected by a fire alarm box.

- Alameda, Calif.
- Tulare, Calif.
- Naugatuck, Conn.
- Winsted, Conn.
- Jacksonville, Fla.
- Augusta, Ga.
- Nampa, Ida.
- Oak Park, Ill.
- Hammond, Ind.
- Clinton, Iowa.
- Rumford, Me.
- Belmont, Mass.
- Beverly, Mass.
- Boston, Mass.
- Cohasset, Mass.
- Everett, Mass.
- Fall River, Mass.
- Holyoke, Mass.
- Marblehead, Mass.
- Newton, Mass.
- Quincy, Mass.
- Reading, Mass.
- Salem, Mass.
- Sharon, Mass.
- Swampscott, Mass.
- Walpole, Mass.
- Harbor Beach, Mich.
- Cloquet, Minn.
- Anaconda, Mont.
- Goldfield, Nev.
- East Orange, N. J.
- Nutley, N. J.
- Passaic, N. J.
- Union, N. J.
- Union Hill, N. J.
- Buffalo, N. Y.
- Cortland, N. Y.
- Flushing, N. Y.
- Harrison, N. Y.
- Ithaca, N. Y.
- Malone, N. Y.
- Niagara Falls, N. Y.
- New York, N. Y.
- Rochester, N. Y.
- Syracuse, N. Y.
- Utica, N. Y.
- Walden, N. Y.
- Watertown, N. Y.
- Conneaut, Ohio.
- Warren, Ohio.
- La Grande, Ore.
- Pendleton, Ore.
- Forty-Fort, Pa.
- Beaver Falls, Pa.
- McKeesport, Pa.
- West Newton, Pa.
- Woonsocket, R. I.
- Columbia, S. C.
- Salt Lake City, Utah.
- Norfolk, Va.
- Spokane, Wash.
- Ashland, Wis.
- Manitowoc, Wis.
- Milwaukee, Wis.
- Superior, Wis.



Rollin Kirby in the New York World.

IN VIEW OF THE MANY SCHOOLHOUSE FIRES, WILL IT COME TO THIS?

The Laying of Concrete Pipe Sewers

CONCRETE pipe, both plain and reinforced, are now being extensively used in all parts of the country for building storm and sanitary sewers. It is not definitely known how early concrete pipe were used for this purpose, but such records as are available indicate that they have been giving excellent service since 1873 in many parts of the United States.

The rapid increase in the amount of concrete sewer pipe laid is evidence that in the

wastes, and the other to serve as a drain for carrying away such surface water as rain, melting ice and snow, and street flushing water. Combined systems handle both sanitary sewage and surface waters in one single sewer. Separate systems are used when conditions make it necessary to treat sanitary sewage in disposal plants. Combined systems are installed if the city is located near large bodies of water into which the sewage can be discharged without danger



84-INCH CONCRETE PIPE READY FOR INSTALLATION AT KOKOMO, IND.
Kokomo's first 24-inch concrete sewer pipe was laid in 1873 and is still in service

opinion of leading municipal engineers its strength, enduring qualities and economy compare favorably with the qualities of other types. The early use of concrete pipe was in sewers of larger diameters; in later years improvements in concrete-pipe-making machinery have made possible the successful manufacture of small sizes which are now equally well received by sewer engineers. Concrete pipe are now made in all standard sizes from 4 inches up to 108 inches internal diameter. They are capable of sustaining the weight of heavy fill in deep trenches or the loads caused by the passage of heavy vehicles when the sewer is near the surface. Because of their impermeability concrete sewer pipe greatly reduce leakage and infiltration.

Designing the System

Sewerage systems are designed on two general plans—separate and combined. The separate system provides two separate and distinct sewers, one to take care of sanitary sewage, including domestic and industrial

of contaminating the water-supply of its own or other communities. Which system to use in a particular case depends not only upon the sanitary factors above referred to, but also upon questions of the most economical construction, and is properly left to the determination of experienced sanitary engineers.

In designing sewer pipe lines, provision should be made for the future growth of the city so that the important trunk line sewers will never have to be replaced by pipe of larger size. Many cities are frequently compelled to replace at great expense old sewer lines with larger pipe because the city's growth exceeded expectations.

Special attention should be given to regularity of alignment and gradient of sewers. Irregularities not only cause decreased capacity, but also make maintenance difficult and expensive. In hilly country requiring broken grade lines, the cities served by the sewer system should be divided into districts separated by intercepting or trunk

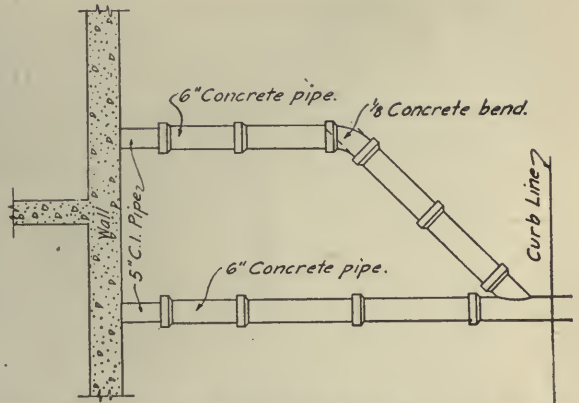
sewers, thus permitting uniformity of grade and alignment within each division.

Typical methods of placing house connections are presented in the accompanying illustrations. House connections should never be under 6 inches internal diameter and should be laid as straight as possible and on a minimum grade of 2 per cent ($\frac{1}{4}$ -inch per foot). The danger of clogging in smaller sizes is so great that the slightly increased cost of the 6-inch connection is justified. Final inspection should be made of each lateral and connection and an accurate location record kept of the Y at the lateral and the end of house connection at the property line. Sketches of any change from original plans should be made and recorded.

The type of manhole design shown is used to avoid unnecessary excavation where a considerable difference in elevation exists between two lines, and to maintain uniform velocity of flow. A type of concrete block manhole adopted in Terre Haute, Ind., is also shown.

All storm water should pass through a catch-basin like that shown, before entering the sewer, in order to remove silt and other material that would otherwise clog the sewer.

A lamp hole is, as its name implies, an opening through which a lantern may be let down into the sewer line for the purpose of



PLAN SHOWING THE BALTIMORE METHOD OF PLACING DOUBLE HOUSE CONNECTIONS UNDER A SIDEWALK

locating obstructions. Such holes are installed by some engineers where manholes are more than 400 feet apart.

Construction Methods

The recommended practice for laying sewer pipe, adopted by the American Society for Testing Materials in 1919, should be closely followed in order to insure best results. Extracts are given below.

"The foundations in the trench should be formed to prevent any subsequent settlement and thereby possibly an excessive pressure and consequent rupture of the pipe.

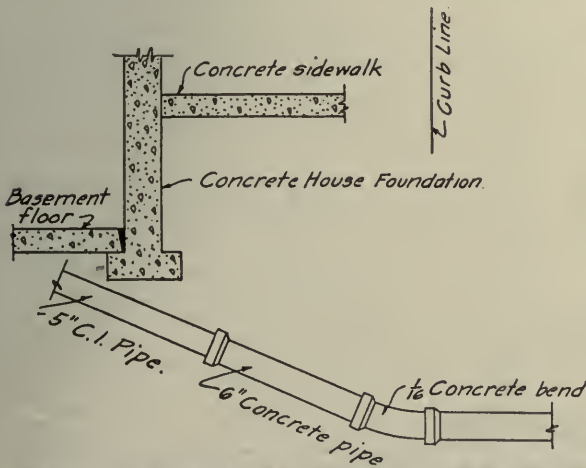
"If the foundation is rock, an equalizing bed of concrete or sand well compacted should be placed upon the rock. The thickness of these beds should be not less than 4 inches. Pipe should be laid in these beds so that at least the lower third of each pipe is supported its entire length.

"If the foundation is good, firm earth, the earth should be pared or molded to give a full support to the lower third of each pipe, and, if necessary to secure a proper bearing for the pipe, a layer of concrete, fine gravel or other suitable material should be placed. The same means of securing a firm foundation should be adopted in case the excavation has been made deeper than necessary.

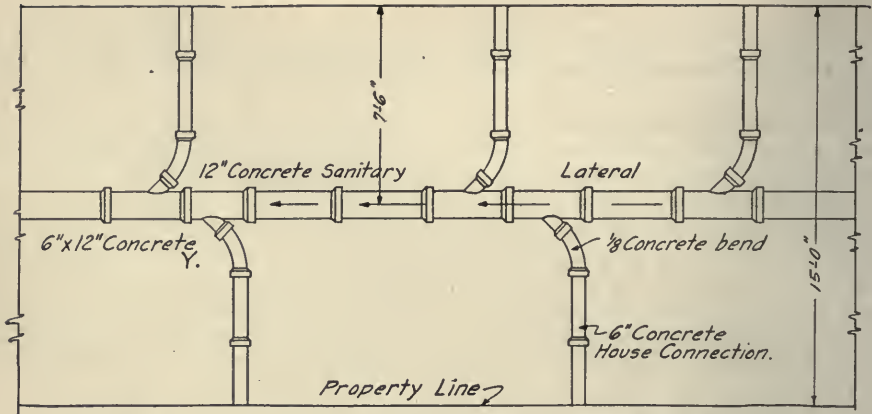
"If there is no good natural foundation, the pipe should be laid in a concrete cradle supported on a masonry foundation carried to a soil of satisfactory bearing power, or supported on a structure designed to carry the weight of pipe and its load to a firm bearing.

"Trenches should be kept free from water until the material in the joints and masonry has sufficiently hardened.

"To protect pipe lines from un-



METHOD OF PLACING A SINGLE HOUSE CONNECTION UNDER SIDEWALK. UNNECESSARY BENDS SHOULD BE AVOIDED



TYPICAL ARRANGEMENT OF 12-INCH SANITARY LATERAL IN AN ALLEY
 Concrete Y's are used instead of T's, thereby increasing the hydraulic efficiency of the line

usual stresses, all work should preferably be done in open trenches.

"Pipe lines should be placed at a sufficient depth below the surface of the street to avoid dangerous pressure or impact. When this is not possible, special reinforcement should be provided.

"Trenches should be only of sufficient width to provide a free working space on each side of the pipe, preferably not over one-third of the nominal diameter, and never less than 4 inches, according to the size of the pipe and the character of the ground; but in every case there should be sufficient space between the pipe and the sides of the trench to make it possible to thoroughly ram the back-filling around the pipe and to secure tight joints.

"The laying of pipe in finished trenches should commence at the lowest point, so that the spigot ends point in the direction of flow.

"All pipe should be laid with ends abutting and true to line and grade. They should be fitted and matched so that when laid in the work they will form a sewer with a smooth and uniform invert.

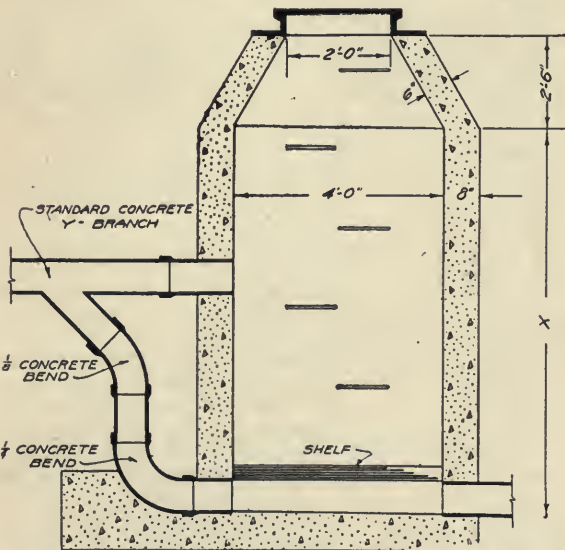
"It is necessary to use all possible care when shoving the pipe together, so that the joints will not be unnecessarily large.

"Sockets should be carefully cleaned before pipe is lowered into trenches. The pipe should be so lowered as to avoid unnecessary handling in the trench.

"The pipe should be set firmly to line and grade and the joints carefully adjusted and filled with the jointing material.

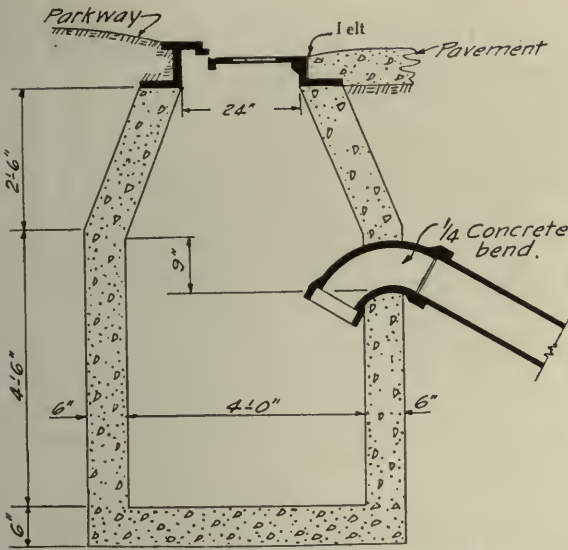
"Joints should be made in the following manner: A closely twisted hemp or oakum gasket of suitable diameter, in no case less than 3/4-inch, and in one piece of sufficient length to pass around the pipe and lap at the top, should be solidly rammed into the annular spaces between pipe with a suitable calking tool. When cement joints are used, the gasket should first be saturated with neat cement grout. The remainder of the space should then be completely filled with the jointing materials.

"All trenches and excavations should be backfilled immediately after the pipe is laid therein, unless other protection of the pipe line is directed. The backfilling material should be selected and deposited with special reference to the future safety of the pipe. Clean earth, sand or rock dust should be solidly tamped about the pipe up to a level at least 2 feet above the top of the pipe. This material should be carefully deposited in uniform layers. Unless otherwise permitted, each layer should be carefully and solidly tamped or rammed with proper tools, so as not to injure or disturb the pipe line.



A TYPICAL CIRCULAR CONCRETE SANITARY MANHOLE WITH DROP CONNECTIONS USED TO AVOID UNNECESSARY EXCAVATION

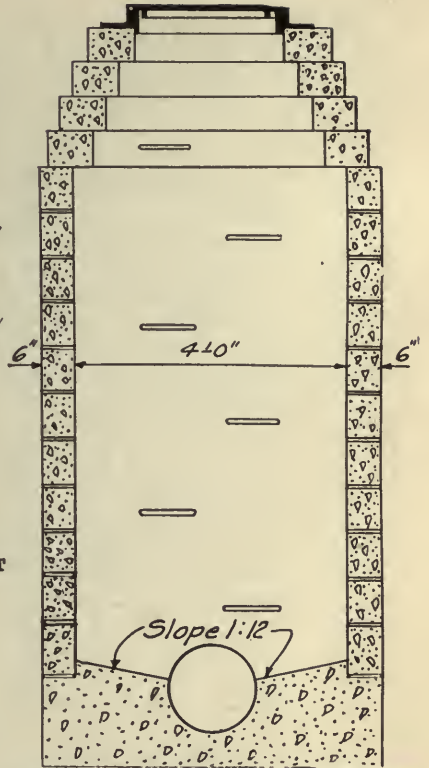
A common method where there is considerable elevation between two connecting lines and to maintain uniform velocity and flow throughout the system



TYPE OF CATCH-BASIN COMMONLY USED TO COLLECT SEDIMENT FROM STORM WATER

"Puddling or water flooding for consolidating the back-filling is recommended only for sandy and gravelly materials. If this method is used, the first flooding should be applied after the back-filling has been compacted by tamping up to 2 feet above the top of the pipe, and the second flooding during or after the subsequent filling of the trench. An excess of water should be avoided, in order to prevent disturbance of the earth under and around the pipe and also to prevent an undue excess of pressure upon them.

"Walking or working on the completed sewer, except as may be necessary in tamping or back-filling, should not be permitted until the trench has been back-filled to a height of at least 2



VERTICAL SECTION OF CONCRETE BLOCK MANHOLE ADOPTED BY TERRE HAUTE, IND.

feet over the top of the pipe.

"The filling of the trench should be carried on simultaneously on both sides of the pipe in such a manner that injurious side pressures do not occur."

Municipal Art League of Chicago Prepares Artistic Post-Cards

The tourist and even the traveling business man will admit that they have often sought vainly for some true expression of the beautiful sights they have viewed in the cities and towns through which they have passed. It is indeed a regrettable fact that few cities in the United States have offered to travelers artistic pictures of the beauties of their respective localities. The average picture post-card sold throughout the country has not satisfied the demand of discriminating people—people who have an appreciative and true sense of artistic values.

The Municipal Art League of Chicago is

directing the publication of a worthy series of post-cards of Chicago and vicinity. It is an interesting fact in this connection that this organization was a pioneer in the "City Beautiful" movement. Its prime purpose is to encourage civic art and to oppose influences that threaten to check endeavors in this direction.

The cards selected for reproduction and distribution are mostly prize-winners in a contest conducted by the Chicago Camera Club. There are twenty-four cards in the issue, representing the most interesting and attractive scenes in the city, all done in excellent photogravure.

Bituminous Pavements Laid on Old Macadam Streets in Denver

By J. W. Johnson

Senior Highway Engineer, U. S. Bureau of Public Roads

THE city and county of Denver during the past ten years have paved a number of streets with various types of bituminous surfaces on old macadam bases. The different types laid to date are asphaltic concrete, tar concrete, "Amiesite," sheet asphalt, and "Willite." The first attempt at this construction was made by the city in 1910, when four blocks on Speer Boulevard were paved. Three types of pavement were laid in the following order, each type being used throughout one block: asphalt concrete, tar concrete, "Amiesite," and tar concrete. In 1912 the paving on this street was continued for a distance of eight blocks, using asphalt concrete. In the same year a block on Eighteenth Avenue, from Sherman to Grant, was paved with "Amiesite." In 1913 the block between Sherman and Lincoln on Eighteenth Avenue was paved with asphalt concrete.

In 1916, 1917 and 1918, 35 to 40 blocks were paved with sheet asphalt and asphalt concrete. One block of "Willite" was laid in 1919. In 1920 a total of 112,920 square yards of asphalt concrete and "Willite" pavement was laid.

All the streets paved in this manner had previously been improved by grading, curbing and gutter, and surfacing. The surfacing originally placed varied in different parts of the city. Disintegrated granite, slag, and oil macadam were used.

The width of the streets varied from 30 to 40 feet between curbs. The width of the gutter was usually 2 feet. The crown varied from 8 to 12 inches. All the streets had previously been supplied with storm sewers. Intakes to sewers were provided at intervals, so that the maximum length of run-off of surface water was about 600 feet.

Owing to the light annual precipitation (an average of about 14 inches), the high crown on pavements, and the short distances that surface water has to travel before entering sewers, there is very little opportunity for the subgrade to become wet so long as the pavement is in good condition. Only a

very few places where settlement of the subgrade has occurred are in evidence. Practically all these defects occur under the earlier pavements.

With the exception of a small amount of "Willite," all of the 1920 construction was asphaltic concrete, 1½ inches thick on a 1½-inch binder course. Both Mexican and California asphalt, with a penetration of from 50 to 60, were used. The binder course was mixed in the proportion of 50 pounds of asphaltic cement to 250 pounds of sand and 750 pounds of smelter slag (maximum size 1 inch). The surface course was mixed in the proportion of 80 pounds of asphaltic cement to 85 pounds of limestone dust, 300 pounds of slag (maximum size ¾-inch), and 535 pounds of sand.

The mixing was done at stationary plants, and the material was transported to the job in auto trucks. The mixing plants and trucks are owned and operated by the city. All of the work, including the grading and preparation of the subgrade, is done by the city by day labor. No contracts are let for any portion of the work of this character.

Preparation of Subgrade

The surface of the street selected for paving is scarified by the use of a scarifier attached to a heavy blade machine and pulled by a 10-ton caterpillar tractor. The depth and amount of scarifying depend on the condition of the old macadam and the amount necessary to be removed. As all the streets paved have either brick or concrete gutters, it becomes necessary to remove 3 inches of old material at the junction of pavement and gutter. From this point the amount of material removed is decreased to the center of the road, where only the amount necessary to bring the road to a uniform crown is taken off.

The material loosened by the scarifier is bladed into windrows, about 6 feet wide and 3 feet high, and then loaded into wagons by means of a traveling bucket loader. After the excess material is removed, the roadbed is thoroughly rolled until hard and firm.



REMOVING EXCESS MATERIAL AFTER SCARIFYING AND RESHAPING MACADAM STREET IN DENVER PRIOR TO APPLICATION OF SHEET ASPHALT TOP

All depressions are then filled with good material and again rolled and brought to a uniform grade and cross-section.

Upon this subgrade the asphalt binder course and surface course are laid in accordance with usual practice.

Cost of Pavements

The number of square yards of pavement of this character laid during the season of 1920 was 112,920. The total cost of this work was \$127,768.77, which is at the rate of \$1.13 per square yard. This price included the grading necessary to prepare the subgrade. The average cost of grading amounted to \$.05 per square yard of pavement. In other words, the pavement cost an average of \$.98, and the grading \$.15 per square yard.

The items of cost of the work done in 1920 are as follows:

ITEM	Cost per Square Yard
Surface mixture	\$0.281
Binder mixture .....	.210
Fuel .....	.071
Expense .....	.010
Tools and sundries .....	.023
Plant repairs .....	.030
Depreciation plant .....	.013
General salaries .....	.040
General labor .....	.013
Plant labor .....	.115
Street labor .....	.088
Hauling .....	.086
Total for surfacing	\$.980
Grading .....	.150
Total	\$1.13

The various charges entering into the above items are explained as follows:

Surface and binder mixture include the cost of asphalt, limestone dust, sand and slag which are used in them.

Fuel covers all coal used at plant and on steam rollers on job, and fuel oil in the dryer, and electric power for derrick.

Expense includes insurance, taxes, printing, automobile and miscellaneous expenditures.

Tools and sundries include the purchase of tools and miscellaneous plant supplies, water rental, horse feed and shoeing, lubricating oil and grease.

Plant repairs include repairs and replacements to plant and roller parts; also labor in getting plant in shape before starting up in the spring.

Depreciation is 20 per cent of the cost of new equipment purchased.

General salaries include those of the superintendent, bookkeeper at plant, clerk at administrative office, and an inspector.

General labor includes labor in building addition to plant, assembling derrick and any other work not properly chargeable to operation.

Plant labor includes all labor used in operating the plant.



SPREADING SHEET ASPHALT FOR NEW SURFACE ON RESHAPED MACADAM ROAD

Street labor includes all labor used on the street in laying the binder and top.

Hauling includes the cost of trucks and drivers, and street rollers and operators.

Grading includes all labor in preparing subgrade.

Present Condition of Pavements

The most noticeable defects in the present condition of these pavements are sunken spots, roughness or waves in the surface, and surface cracks. The sunken places are all on work done in 1910 and 1912. The largest of these have a diameter of from 8 to 10 feet, and are possibly 8 to 12 inches below grade. This condition is caused by settlement of the subgrade, which was on a comparatively new fill of from 4 to 10 or 12 feet. The street on which these sunken places occur was built along the bank of Cherry Creek, parallel to new retaining walls built to confine the watercourse of the creek. The surfacing was placed on this fill within two years after it was constructed, and evidently prior to the time of complete settlement.

Roughness and waves are in evidence on a number of streets laid during the early period of this construction. Apparently this condition is caused by insufficient care in laying the pavement, or insufficient rolling of the subgrade. This condition does not exist to any extent in work done since 1916.

Transverse cracks in the pavement laid in 1916, 1917 and 1918 are in evidence throughout a large portion of the work. These cracks are usually at right angles to the center line of roadway. Sometimes they extend entirely across the pavement from

gutter to gutter, and sometimes they extend only a distance of 6 or 8 feet each side of the center. Apparently they are caused by contraction and do not indicate any serious permanent defect in the wearing qualities. The distance between them varies considerably; ordinarily they are not less than 30 feet apart.

One block of surfacing laid in 1919 shows the worst cracking of any so far laid. This pavement is so badly cracked that it will undoubtedly have to be replaced in a very short time; in fact, it should be replaced this season. The cracking was apparently caused by the pavement's being mixed with too small a percentage of asphalt. The resulting mixture was too brittle, and severe cracking was evident after the first cold weather in the fall after the pavement was laid.

One disadvantage in this method of constructing pavements is the high crown which very often obtains. This result is caused from the desire to use all of the old macadam possible in the center of the road, and the necessity of meeting the gutter already in place. As the macadam has usually been given a good crown for drainage, the addition of 3 inches of bituminous pavement will as a rule result in 1 or 2 inches of additional crown. This result would be more undesirable in a wet, cold climate than under the climatic conditions usual in Denver.

Acknowledgment is made to C. H. Draney, Superintendent of the Paving Division of the City and County of Denver, for his courtesy and assistance in supplying information and data relative to this work.

The Public Works of Modern Greece

By Walter E. Spear

Board of Water-Supply, New York City

WITH a staff of American and Greek engineers, the writer made, last year, an investigation for a complete system of water-supply and sewerage for the cities of Athens and Piræus. Compared with the eastern part of the United States, Greece is a very dry land. The entire annual rainfall is small; that during

railroad system, but really possesses no modern public works comparable with those of the progressive countries of modern Europe. During the last eight years, modern Greece has spent large sums of money on its army when it could have better been spent on water, sewerage and drainage works, more and better highways, additional



STORAGE RESERVOIR AT ATHENS AT END OF THE HADRIAN AQUEDUCT

the summer is almost negligible, and all available water not required for the needs of men and animals is used for irrigation. The problem of developing an adequate supply of water for a population of 370,000 people now living in these communities, without prejudice to other interests, was not, therefore, a simple one, and all possible sources of supply within 100 miles of Athens were considered. These investigations took the writer over a large part of southern Greece and gave him an opportunity to see something of the existing public works and to learn from some acquaintance with public men the needs of modern Greece.

Need for Modern Public Works

Modern Greece has a few handsome public buildings, some well-paved city streets, an insufficient mileage of indifferent highways, a few trolley roads and an inadequate

railways and improvements of existing lines, and extensive port developments.

Water-Works

With an annual rainfall over large areas of southern Greece of less than 20 inches, most of which falls in the months of October to May, inclusive, and with a high percentage of run-off from rocky mountain slopes and semi-impervious soils, the amount of water available during the long, almost rainless summers is consequently small. Surface reservoirs for the storage of the winter rains have seldom been constructed, and the conditions are not generally favorable for such construction.

Outside of the larger cities, water is seldom piped to private dwellings; every householder carries his supply from the constantly flowing fountains, which are so conspicuous a feature of the Greek villages. The water from these fountains appears to be of a



ANOTHER STORAGE RESERVOIR AT ATHENS ON THE HADRIAN AQUEDUCT

satisfactory quality, except for the universal hardness. It is generally cool, though an agreeable temperature cannot be long maintained without ice during the heat of the summer, even by the use of porous jars. The amount of water actually used in these villages is naturally small, but none is lost, since the overflows of the fountains irrigate the village gardens and perhaps the fields outside. When the larger villages in Greece, which are now favored with sufficient water for their public fountains, install modern plumbing and begin to use as much water as other Mediterranean communities in France, Italy, or even in Egypt, it is going to be difficult to find water for their needs. Some villages, to which most of the water used

is hauled several miles in barrels, may never be able to procure enough water to greatly raise their present standard of cleanliness. In some localities surface water might be developed, but the prejudice against its use for domestic consumption is very strong and cannot be readily overcome.

The largest problem in water-supply in Greece, and one that has been considered for some years by the Greek government, is that of providing an adequate supply of water for the cities of Athens and Piræus. These cities sometimes have during a dry summer but little more than ten gallons per capita, quite insufficient for their needs. Most of the Athens supply is furnished by the aqueduct and galleries, some 16 miles



AN OUTFALL SEWER NEAR DANIELS' CHURCH, ATHENS



A NARROW STREET IN THE OLDER QUARTER OF ATHENS

in length, that were built in the second century of this era, during the reign of the Emperors Hadrian and Antoninus Pius. The covered reservoirs at the end of the Hadrian aqueduct are seen in the illustrations. The Hadrian aqueduct was built as a tunnel through the limestones and conglomerates of the hillsides and valleys back of the city and is in some places 120 feet below the surface. The supply from this aqueduct is extremely hard, but otherwise satisfactory. Some additional water for Athens is provided by large open wells in the vicinity, and all of the inadequate supply delivered to Piræus comes from similar sources near that city, which provide a water much inferior in quality to the supply of Athens.

Most of the new sources of supply proposed for Athens during the past thirty years or more have been distant springs, the immediate development of which would represent a heavy burden upon the financial resources of the cities to be served. English, French and Austrian engineers have from time to time reported on the project of bringing to Athens and Piræus a supply of 20 million gallons or more of water from the springs near Lake Stymphalia, in the Peloponnesus, some 70 miles away in a straight line. The springs are at an elevation of about 2,000 feet and may be brought to Athens by gravity, but at the Isthmus of Corinth the necessary siphon at approximately sea level would be subjected to a



A WINDING ROAD OVER MT. CITHÆRON

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very heavy pressure to deliver the water in Athens at the level required. Other sources that have been suggested are large springs in Bœotia, at the headwaters of the Melas River in the basin of Lake Copais. These springs have an elevation of only 300 to 400 feet above sea level and, though somewhat nearer Athens than those at Lake Stymphalia, would require pumping against a high head to get them over the Cithæron or Parnes Mountains, lying between Bœotia and the plains of Attica, in which Athens is located. The writer reported on still another source of supply somewhat farther away than either of the above, on the slopes of Mt. Parnassus, at an elevation of about 1,000 feet. These sources, which would supply fully as much water as those at Lake Stymphalia, may be brought to Athens in a gravity aqueduct that could be located over much more favorable ground than that from Lake Stymphalia, and a first development of surface water could be made along this aqueduct not far from Athens, at a favorable site for a large storage reservoir, which would serve to equalize the flow of the springs of the Parnassus sources. This development of surface water would represent a first step in the construction of the entire project.

Sewerage

Modern sewerage works can hardly be said to exist in Greece outside of Athens and in some of the other large cities, and there is little likelihood of any immediate construction of sewerage works except in Athens and Piræus. The general demand for modern sanitation does not appear to be sufficiently great to keep the cities and villages clean with their present facilities or to overcome in many localities the difficulty of finding sufficient water for modern sewerage works, or of securing enough money to build them.

Some traces of the sewers of ancient Athens have been found, but these sewers, dating back to the fifth century B. C., were probably built for storm-water drains and were not intended for the carriage of house sewage. Portions of modern Athens have storm-water drains which carry house sewage, though they were not intended for that use and are ill-designed for the purpose, having large and irregular sections and flat inverts. They are all built of rough rubble, plastered on the inside. A view of the out-

fall sewer of Athens, which carries the sewage to the channel of the Cephissus and to the irrigating ditches below it, is shown on page 24. Large areas in Athens are served by cesspools, and more primitive methods of disposal in open privies or pits are common in the poorer quarters. The need of Athens for a modern system of sewers is great, and proposals have been repeatedly made to provide such works. A few years ago a German engineer prepared plans for a combined system of sewers for Athens and Piræus. The writer, however, after consideration of the problem, adopted a separate system and prepared plans and estimates on that basis. This solution of the problem promised a more satisfactory method of disposing of the house sewage in a city surrounded by steep, rocky hillsides, from which the heavy winter rains would wash into a combined system of sewers so much detritus as to obstruct the summer flow of house sewage and create a nuisance.

The adoption of the separate system would permit the use of the existing sewers as a part of the storm-water drainage system, and would allow of safely discharging all storm water in Athens through comparatively short connections into the adjacent channels of the Ilissus and the Cephissus, and that in Piræus directly into the harbor. The difficulties of tearing up the narrow, tortuous streets of Athens and Piræus and of laying sewers and storm-water drains as well as water-mains there, may only be appreciated by those who have faced some such task elsewhere, and know besides something of local conditions in these Greek cities. The work would necessarily involve careful planning and thorough organization, not to speak of a large expenditure of money.

Roads

Between the small city states of classic Greece, communications were poor and there was no system of cart roads over the entire country. Back in the mountains the writer has seen some excellent examples of ancient highway construction, of well-cut, irregular, polygonal blocks which happen to have been preserved through accident of drainage. Most of these old roads have been eroded and washed away because sufficient drainage was not originally provided, a fault in road construction that is still observable in modern Greece, and, in-

deed, not unknown in our own country. Most of the existing highways are of comparatively modern construction, and it is not clear just why many of the mountain roads without gutters and adequate culverts do not entirely wash away during the winter. Certain it is that it is no pleasure to travel over them and, in the general absence of guard-rails on bridges and steep mountain sides, it is not very safe to do so. The much despised Turk appears to have done not a little road-building in his time and has

Greece seen more clearly than in the neglect of the roads. Some important highways of macadam construction are now quite impassable, even with a Ford. In the vicinity of Athens there has been recently a large increase in the use of heavy motor busses to the surrounding towns, and that, with the automobiles and motor trucks, all driven at a pace that alarms the visitor, is destroying the roads more rapidly than they can be repaired. A road built of soft limestone rock, with a filler of sand and dust of the same



AN OLD TURKISH BRIDGE NEAR MT. PARNASSUS

left some very creditable bridges, a form of construction in which the Greek of to-day, as in the past, does not appear to excel.

The large cities of Greece have some admirably paved streets, generally asphalt, but even in the cities and everywhere outside, with the exception of one short piece of road near Athens, the highways are surfaced with water-bound macadam, some of which is constantly being repaired and as quickly destroyed. Sometimes the destruction is the result of the torrential winter rains, but not infrequently it is done by heavy motor traffic, busses and trucks. I suppose that nowhere is the strain of eight years of war in

material, cannot be expected to stand up long in the dry summer when it sometimes does not rain for weeks at a time.

Some new road construction was being carried on by the government last fall through a contract with an English firm, one road near Athens, another back in the mountains. Both were being surfaced with water-bound macadam. No doubt, if the hopes of the Greeks are realized and oil is discovered in Greece, some improvement in the character of construction may be looked for.

ACKNOWLEDGMENT.—From an address by the author printed in the *Journal* of the Boston Society of Civil Engineers, June, 1921.

The Prevention of Disease

There is a vast amount of confusion in the public mind as to ordinary cleanliness in public health. Many cities are esthetically planting nasturtiums where the ash-pile stood and are permitting typhoid fever and diphtheria carriers to roam at large.

While health itself cannot be bought, money and efficient organization can buy prevention from disease and infection, which in the end is the same as purchasing health.

Public Health, State Department of Health, Lansing, Mich.

From Natural Gas to Electric Street Lighting

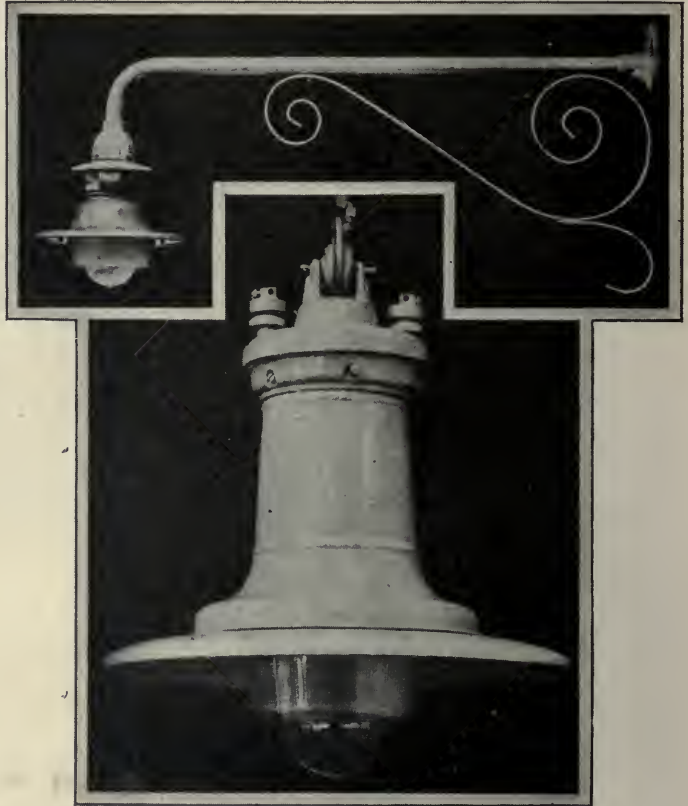
Borough of Kane, Pa., Makes Contract with Local Company for Electric Street Lighting Service

By O. S. Scott

Chairman, Lighting Committee, Borough of Kane, Pa.

IT has been the custom in many Pennsylvania cities located in the natural gas belt to use for street lighting this almost free source of illuminating material. In the old days in Pittsburgh open-end tubes were left flaming day and night, as it was cheaper to let them burn than to hire the necessary labor to shut off the gas at daybreak and to light them at night. In many cities to-day it is the custom to leave the Welsbach mantles burning all the time and have a man go around and turn the gas on full at night and turn it down in the morning. Lighting with natural gas is now becoming a considerable item of expense owing to the scarcity of gas and its gradual increase in price. It is only a question of time when street lighting by natural gas, in Pennsylvania particularly, will be a thing of the past.

In order to provide itself with adequate and modern street lighting, the borough of Kane has drawn up an ordinance and made a contract with the electric service corporation. The contract and ordinance call for the service for a period of ten years at a rate of \$28 per year for each 100-candle-power light, \$43 per year for each 250-candle-power light, and \$55 per year for each 400-candle-power light. The company under this agreement has furnished and installed and will maintain all lights, stand-



TYPES OF PENDANT ELECTRIC STREET LIGHTING FIXTURES IN KANE, PA.

ards, poles and wire, as well as furnishing the electricity.

The illustrations herewith show the two types of fixtures in use. The 150- and 200-candle-power lights are of the bracket type with band refractors, and the 400- and 600-candle-power incandescent lights are of the Novalux pendent type with band refractor and reflector.

In this manner another Pennsylvania borough has stepped forward into the ever-increasing group of well-lighted cities.

How Polk County Pulled Out of the Sand

An Interesting Method for Building Sand-Clay Roads, and a Lesson in Road Widths

By H. S. Jaudon

PRIOR to 1915, Polk County, Fla., was almost isolated because of the poor condition of its sand roads. In that year the Board of County Commissioners decided to make some experiments to see if a type of road could be built at a reasonable cost to connect the county with contiguous territory. The only logical way by which they could provide the funds was by a bond

extensively used in Florida at that time, would cost about \$3,500,000, so that some other type of road had to be developed.

In the city of Bartow, Fla., in 1912, an asphaltic concrete pavement was laid on what is known locally as a Bartow clay base. This is a clay found in the vicinity that has the property of setting up when water is applied and making a reasonably hard sur-



"BEFORE AND AFTER" SCENES ON POLK COUNTY ROADS, FLORIDA

issue, and the only way they felt that it would be possible to carry a bond issue would be to build a system of roads to connect every town in the county with every other town. They were therefore confronted with the problem of building almost 217 miles of road in order to get a proposition before the people which would appeal to them and bring out the favorable vote. The largest bond issue which it was felt could be placed before the people was between one million and one and one-half million dollars. Brick roads, which were

face. This type of construction had given good service, and no money had been spent on it for maintenance.

The Commissioners employed the H. S. Jaudon Engineering Company of Elberton, Ga., which had laid the Bartow pavement, to lay five demonstration stretches of this pavement in different parts of the county. These demonstration stretches were laid in 1915 and are still in use. From the results obtained in Bartow and by observing the demonstration sections, the County Commissioners felt that this type of road would be

satisfactory and submitted a bond issue for one and one-half million dollars to the voters in 1916. This was the largest amount that had ever been asked in a bond issue in the South for road building, but it was carried by a large majority. The construction work was divided into five contracts for the road work and one for the bridges. Work began in the fall of 1916, and the entire system was finished in the fall of 1918.

Type of Construction

The roads were laid as sheet asphalt pavements with clay base, the clay being the most available found alongside or near the roads that were being constructed. In the middle and southwestern part of the county, Bartow clay or a low-grade soft phosphate rock was used and an excellent base obtained. In the northern and eastern parts of the county a sand-clay mixture was used, as the extra freight for shipping Bartow clay to these points would have added some \$200,000 to the bond issue. The widths of the roads were fixed by the County Commissioners and governed by conditions of traffic and the money available. The system covered 217 miles, and of this about 100 miles was 15 feet wide and the remainder 9 feet wide. Already there is an effort being made to secure funds to widen the 9-foot roads. The cost of maintenance on the 15-foot road has been very small, while the maintenance on the 9-foot road has been a little higher. In fact, 90 per cent of the money that has been spent in maintenance has been spent on the 9-foot-wide roads.

The system has demonstrated that while a 9-foot road is better than sand to travel on, from the commercial and investment standpoint it is a mistake to build a road of this width. The system has also demonstrated that it is possible to build this type of road and obtain good results, but that proper drainage is very essential in the construction. Almost every one of the few cases in which failure has occurred can be traced to the road-bed's not being high enough out of the water, or to the drainage system's having been allowed to get into a condition so that it was not functioning properly.

The asphalt surface was laid as near a true sheet asphalt as possible with the products which could be obtained in Florida. The effort was made as far as possible to buy nothing outside the state except the asphalt and the cement. Coarse sand was obtained from a pit developed in the northern part of the county near Davenport and from Lake Weir, and the fine sand from near the plants. The filler was obtained by grinding Florida limestone, which is practically an entirely new industry.

The cost of these roads to the county complete was about \$1.30 per square yard. This means the completed roads, including the asphalt top, the base, the grading and the engineering supervision. The completed 15-foot roads cost between \$9,500 and \$10,000 per mile. The immediate result of the improved road system was that property values throughout the county very nearly trebled, and because of the increase in the value of property the tax rate has been increased only about two mills.

One in Ten Physicians Will Write It "January, 1921"

At least ten per cent of the physicians in the various states during January, 1922, will continue to date birth certificates, January, 1921, unless they make special resolutions not to, according to vital statisticians of the various state health departments, basing their estimates on mistakes made in other years. Such incorrect dating of birth certificates, they point out, is an infraction of the law. It adds a year to the age of the child, it may make the child appear to be born out of wedlock, or it may permit parents to force the child to leave school a year too early, to get working papers illegally, and may make boys liable to military service before their time. An incorrect

birth certificate may prove a source of entangling inconvenience to the child throughout life.

Whenever a certificate is found that is obviously dated incorrectly, attempts are made to correct it. This requires considerable clerical help, as affidavits must be secured, and is an expense to the individual and to the taxpayers of the state. Explaining the psychology of the physicians' January mistake, one of the workers defined memory as "the mental revival of conscious experience," adding that "automatic action such as writing and speaking may at first be conscious and ultimately become subconscious yet form the basis of special memories."

Forward Steps in Municipal Affairs

City Planning Commissions

The Moral Force of a City Plan

DECATUR, ILL.—Not a few communities have city plans that are dead. Carefully prepared by some recognized planner, paid for by voluntary contributions, and adopted by civic gatherings with enthusiasm, they have been forgotten, and lie neglected and dust-covered, while the city continues to develop without order or design.

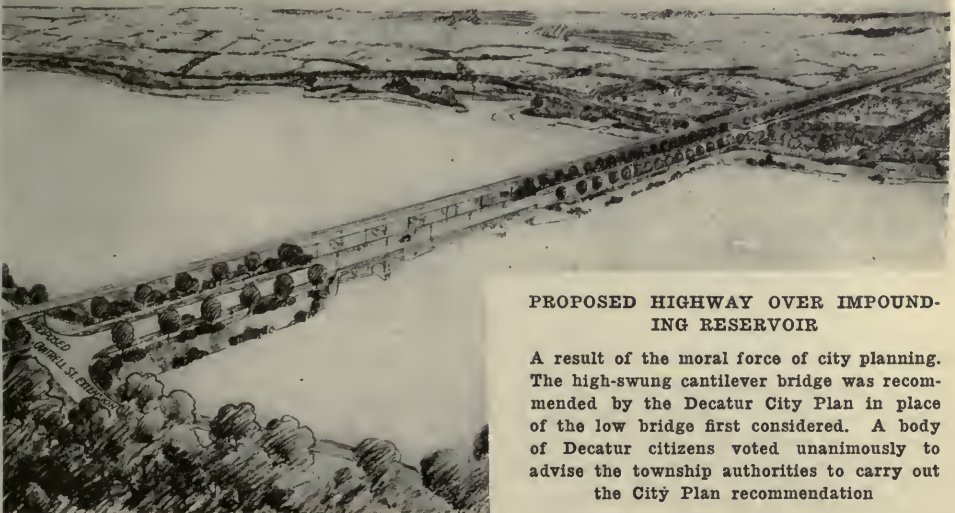
The real problem with a voluntary city planning board that is not clothed with legal powers to enforce the plan, is to make the plan a living, breathing thing which will really accomplish results.

The Planning Commission of Decatur, Ill., which is a large committee of the Association of Commerce, believes that if a plan is kept before the people through newspaper publicity, talks to clubs and schools, and conferences with the city council, it should

have a marked effect upon community development even if there exist no means of enforcing it.

Public sentiment can accomplish remarkable results. A community that is "sold" on its plan is not inclined to be tolerant with those who disregard it. The fact is that a plan which is kept alive is a moral force in the direction of orderly development.

Decatur is now completing an impounding basin 13 miles in length, which will give it an ample water-supply and provide recreational facilities at the city's door. A recommendation in the Plan was that a new bridge crossing the lake should be placed at a high elevation near a railroad trestle instead of being placed where an old low-level bridge had been serving. Opposition to the high structure had been expected from some interested property owners, but at the hearing on the site of the bridge, attended by business men, small neighborhood storekeepers, and workmen in the factories, the expressed opinion was unanimous that the Plan recommendations should be carried out. It was a great victory for foresight



PROPOSED HIGHWAY OVER IMPOUNDING RESERVOIR

A result of the moral force of city planning. The high-swing cantilever bridge was recommended by the Decatur City Plan in place of the low bridge first considered. A body of Decatur citizens voted unanimously to advise the township authorities to carry out the City Plan recommendation

and vision, and it will give the city a beautiful and dignified gateway instead of a mere river crossing.

The Plat Committee of the Board of Supervisors came before the Commission and voluntarily announced that it would not recommend for record any plat that did not correspond with the Plan.

Frequent inquiries are made of the Commission as to what the Plan provides as to the location of industries. The real estate dealers have been invited into the Commission's conferences, and are now particularly interested in zoning, a scheme never thought of until the Plan was inaugurated.

The Plan Commission has gone on record as favoring the appointment by the Mayor of a legal body to take over its functions under the law recently enacted providing for city plan boards, but it has been advised by Myron H. West, city planner, that the Commission as a voluntary committee should continue its work of education and advice in order that the Plan may be constantly before the community, as a moral force.

W. F. HARDY,
Chairman, City Planning Commission.

An account of the Decatur Plan appeared in the October, 1920, issue of THE AMERICAN CITY, page 383.

City Managers

How a Texas City is Relieving Unemployment

HOUSTON, TEXAS.—This city is striving to meet its unemployment problem in a practical way. Every unemployed man who proves himself not to be a professional floater is hired by the city as a park employee.

While it is realized that the wage of \$1.25 a day is extremely small, it is enough to keep body and soul together until something better is available. The city has suggested to large employers of labor that they give the men at work in the parks the preference when in need of additional help, and those doing the best work for the city at the nominal wage are given the first opportunity to take advantage of the better-paying jobs when offered. Several of the larger oil companies have thus had the opportunity to

secure the services of men who have been tested as willing workers.

Since the city inaugurated this employment scheme, an average of 250 men have reported each day at Herman Park, where most of the work is being done. For 10 cents the men are given a large mug of coffee and two generous sandwiches. The wage is paid each day so that the men will have cash to take care of dire necessities.

C. E. BELK,
Manager.

Health Departments

An Effective Step to Keep Down Epidemics

KENILWORTH, ILL.—The following notice has been sent to all householders. It is designed to force physicians to report all diseases instead of neglecting to do so at the request of the patient or his family:

"In order to centralize records, the Village Board has recently appointed the Village Manager as Health Officer and Captain Murray as Deputy Health Officer for Kenilworth. These men serve in this capacity without additional compensation.

"In addition to the notification required of the attending physician, you are required to notify the Health Officer or, in his absence, the Deputy Health Officer, of any case of a reportable disease of which you have knowledge either inside or outside of your family, as required by the Illinois Department of Public Health.

"In order to preserve and improve the public health, it is required that every case or suspected case of any of these diseases must be reported to the local health authority within twelve hours, by the attendant, householder, or any other person having knowledge of such known or suspected case. A report made by telephone must be followed within twelve hours by a written report.

"Local health authorities must transmit copies of all such reports to the State Department of Public Health, Springfield, within twelve hours after receipt of same.

"Health officers who fail, neglect or refuse to enforce the rules for the control of communicable diseases, and all persons who violate these rules, subject themselves to a fine of up to \$200 for each offense, or imprisonment in the county jail not to exceed six months, or both.

(Signed) DIRECTOR, ILLINOIS DEPARTMENT OF PUBLIC HEALTH."

A complete list of reportable diseases accompanies this notice.

F. L. STREED,
Village Manager.

Fire Departments

Fire Alarm Boxes in Schools, Hospitals, etc., Made Mandatory

COLUMBIA, S. C.—Following the passage of an ordinance in Columbia requiring all public schools, hotels, hospitals, moving-picture houses and theaters to install fire alarm boxes, such boxes were installed at once. The ordinance was prepared by the writer and F. D. Marshall, Council Superintendent of the Electrical Department.

For the installation an oval shell type of Gamewell fire alarm box was used, and all wires were run in rigid conduits. The city feels that a distinct step in public safety has been taken through the passage of the ordinance and the immediate installation of the boxes.

The ordinance reads as follows:

An Ordinance to Amend an Ordinance Entitled "An Ordinance Requiring All Public Schools, Hotels, Hospitals, Moving-Picture Houses and Theaters to Install Fire Alarm Boxes"

Be it ordained by the Mayor and Council of the city of Columbia in council assembled:

That an ordinance requiring all public schools, hotels, hospitals, moving-picture houses and theaters to install fire alarm boxes be amended, and the same is hereby amended by adding the following proviso:

"That in case any person, firm or corporation shall hereafter operate or conduct any said public school, hotel, hospital, moving-picture house or theater without installing said fire alarm boxes, as herein stated, within thirty days after notice in writing to do so having been given by the representative of the city, he, she, or it shall be fined, upon conviction before the Recorder, a sum not exceeding one hundred dollars, or imprisoned for a period not exceeding thirty days, and each and every day after the expiration of the said thirty days that the terms of this ordinance are not complied with shall be deemed and considered a separate offence." That the said ordinance when so amended shall read as follows:

That all public schools, hotels, hospitals, moving-picture houses and theaters are hereby required to install at their own expense standard Gamewell fire alarm boxes at such place, or places, as shall be designated by City Council, or their representative, the city to maintain same after installation. That boarding-houses with more than twenty-five rooms will be classed as hotels.

That in case any person, firm or corporation shall hereafter operate or conduct any said public school, hotel, hospital, moving-picture house or theater without installing said fire alarm boxes, as herein stated, within thirty days after notice in writing to do so having been given by the representative of the city, he, she, or it shall be fined, upon conviction before the Recorder, a sum not exceeding one hundred dollars, or imprisoned for a period not exceeding thirty days, and each and every day after the expiration of the said thirty days that the terms of this ordinance are not complied with shall be deemed and considered a separate offence.

W. H. HARTH,
City Electrician.



A "HOME-MADE" TRAFFIC STANDARD THAT WILL GIVE LONG SERVICE

Highway Departments

A Simple and Effective Traffic Standard

LA GRANDE, ORE.—The picture above shows a traffic standard of simple construction which is giving complete satisfaction in this city.

The base is of reinforced concrete, 2 feet in diameter and 1 foot in height, of which 5 inches are vertical, and the remainder rounded. The disks are 9 inches in diameter, cut in two, and placed at right angles in a piece of pipe 1¼ inches in diameter and 30 inches long. Six inches of the pipe are embedded in the concrete base. Eleven of these traffic standards have been made at a total unit cost of about \$9.86.

Their durability has been tested for several months, during which a number of machines have collided with them. These accidents have resulted in very little damage to the standards, but it has been remarked that no machine has yet hit a standard a second time.

GEORGE GARRETT,
City Manager.

Recreation Departments

A Bath-House That Serves the People

OMAHA, NEBR.—Located between Cass and Chicago Streets and between 15th and 16th Streets, in Omaha, lies Jefferson Square, containing 1.72 acres. This park, although one of the smallest in the system, is patronized daily by thousands of people, principally those living in the most congested section of the city, and many who have no home whatever. It is known as "No Man's Home."

In the center of this park stands the Jefferson Square public bath-house and comfort station for men and boys. As few women patronize this park, and as this is the first public bath-house in Omaha, a women's department was not built.

The outside walls are built from old cobblestones that were torn up from the streets. The inside walls are cement, and there are cement partitions and floors.

The caretaker's office contains two large automatic gas heaters, cupboards for supplies, brooms, etc. Across from this is the comfort station, with toilets, wash-bowls, etc. In the middle of the building is the men's locker room, equipped with about forty lockers, and back of this is the men's shower-bath room containing ten shower-baths. This is a large room, well equipped and lighted, with the showers in the middle.

Steel partitions are used to separate the showers, but there are no doors. A separate locker room and shower room with four "gang" showers is reserved for boys. Before this building was built, a survey of the district was made. It was found that a large number of the men living in the district worked in the smelters and railroad shops and that there were very few bath-tubs in the district. Besides this, most of the "floating population" made this square their headquarters. The bath-house is usually kept open from June 1 to October 1, and as a rule is self-supporting. This year, owing to large repair bills on our heaters, we lost about \$200. The bath itself is free. A bath towel and soap are sold for ten cents; also a key to a locker. The key and towel must be returned to the caretaker after the bath. Boys are charged but five cents. Following is the final report submitted to the City Council, which speaks for itself:

JEFFERSON SQUARE BATH-HOUSE

Number of Bathers, Receipts and Disbursements

For Year 1921

Total number of bathers with own towels.....	3,101
Total number of towels issued at 10c for men..	9,572
Total number of towels issued at 5c for boys..	578

Total number of bathers for the season..... 13,251

RECEIPTS

From towels issued.....	\$986.10	
From Recreation Fund.....	235.43	
		\$1,221.53

EXPENDITURES

For disinfectant	\$35.90	
For toilet supplies	32.31	
For repairs to heater.....	72.60	
For repairs to roof.....	39.50	
For laundry	303.01	
For gas	276.38	
For soap	75.00	
For caretaker	386.83	
		\$1,221.53

IRA B. JONES,
Director of Recreation.



THE BUSINESS SECTION OF CEDAR RAPIDS,

The large bridge on the left has recently been opened for traffic. It is 600 feet long and to the city, which plans to erect on it a city hall and county court house, making it a real

Public Welfare Departments

How Toledo's Emergency Relief Program Has Worked

TOLEDO, OHIO.—With but ten weeks of experience to look back upon, it is perhaps too early to reach any very accurate conclusions concerning the success of the various features of Toledo's program. There are, however, several aspects of that experience which are significant.

It will be remembered from the brief article in the December AMERICAN CITY, that the Mayor's Committee on Unemployment, as organized along lines suggested by the National Conference, consisted of committees on employment bureaus, relief, public work, private work and recreation. It was hoped that these committees would at least provide a means for coordinating the efforts of the city's numerous agencies.

Cooperation of the city's fire-fighters was secured and provision was made for registration of all unemployed at the various engine-houses of the city, with a central clearing-house in the office of the Welfare Director, from which all placements were to be made. Information as to the applicant's needs was secured and to some extent verified by the firemen. When men were needed, cards were pulled from the down-town office, the engine-house where the men had registered was notified, and firemen got in touch with them. Men were required to register from the engine-houses nearest their homes.

Some 3,000 men have registered in this way. By far the greatest share of those registered have been unskilled laborers, only some 300 having a skilled trade. It developed that the skilled workers would not register through the engine-houses, preferring to apply at the regular employment agencies, or trust to their union officials.

The disappointing fact was that very few opportunities for private work were developed. The committee on private work, given the task of finding such jobs, met only a few times and decided there was nothing to be done. A special bond issue of \$490,000 passed by Council for work on parks and boulevards, providing funds for the employment of about 800 men in addition to the regular force. All these men were taken from the list filed with the placement bureau; and since they were hired for shifts of two weeks, it has been possible to give some work to all the unskilled workers registered.

The work that has been done by these men was specially chosen so as to require the least possible amount of material and supplies, so that most of the money has been used for the employment of labor. A new roadway was built leading into an East Side park, and a road already there was raised up from the lowland so as to be high and dry throughout the year. A golf course was constructed in Bayview Park, a perfectly flat piece of land with no trees upon it, and the construction of bunkers, the laying out of a new roadway, and the planting of trees have improved materially the appearance of the park. Underbrush was cleared away from considerable tracts of wooded land recently acquired for park purposes and as yet unimproved. Swampy



IOWA, SHOWING ITS SEVEN BRIDGES

90 feet wide. Its center abutment will form the north end of the island. This island belongs municipal center

portions of the same parks were filled up or drained. A new section of the boulevard is being constructed.

Other public work has been pushed by the County Government and the Board of Education. The county is starting work on a big sewer project which was not to have been begun until spring. New school buildings projected by the Board of Education are being hastened.

Next to public work, the phase of the program which has met greatest success has been that of poor relief. Through the committee on poor relief it was possible to adopt certain uniform principles and to get them followed by the various agencies of the city which had hysterically begun innumerable projects for relieving the needy. The clearing-house established by the Social Service Federation is being used to a greater extent than ever before. Lodges, churches, neighborhood organizations and business men's clubs have been won over to the importance of clearing through this central office. Forms of relief which can-

not be furnished by the city or the Social Service Federation are being provided by these clubs with a minimum of duplication. All over the city women are meeting to repair old clothing, which is then distributed to the poor. At this holiday season all Christmas giving to the poor is being done through a special central clearing-house.

The only remaining phase of the program to be discussed is that of the recreation committee. This committee, headed by Professor Charles Bushnell of Toledo University, has prepared elaborate plans for community entertainments this winter in school buildings and community centers. The Central Council of Civic Agencies has taken up the plan and will assist in carrying it out. The idea is to provide free recreation of all kinds for those who will this winter have more leisure than ever before, while less able to buy entertainment. The plan promises much, but has not begun to work.

WENDELL F. JOHNSON,
Secretary, Commission of Publicity and Efficiency.

The Roads of Houghton, Michigan

GREAT pride is taken by Houghton County, Mich., in its roads. The illustration below shows one of the county roads, known as Frog Pool Hill. This road was built by the penetration method in 1918, using Stanolind Paving Asphalt C. A recent inspection of this road showed that it was in almost perfect

condition, and inquiry brought out the fact that no repairs had been made during the three years the road has been undergoing almost continuous traffic. This and most of the work on the roads in and about Houghton have been done under the supervision of the County Engineer's Department, T. A. Coon, County Engineer.



FROG HILL ROAD, HOUGHTON, MICHIGAN

Detroit's Bureau of Public Safety Gets Results

By Arch Mandel

Detroit Bureau of Governmental Research, Inc.

THE purpose of all traffic regulations, particularly in cities, is to expedite the movement of vehicles through the streets with as few accidents as possible; in other words, it is a safety measure. Traffic officers and mechanical devices of various kinds are all desirable and necessary, but if the toll of injuries and fatalities due to street accidents remains constant or is increased, traffic regulations have not served their full purpose.

In order that the aim of traffic regulation and control might not be lost sight of, Detroit created, by charter, a Bureau of Public Safety within the Police Department and provided that one deputy commissioner should have charge of this Bureau.

The charter provision follows:

Bureau of Public Safety:

The deputy commissioner of police in charge of public safety shall have supervision of the enforcement of all traffic ordinances and regulations affecting streets, avenues, boulevards and other public places, shall keep a record in his office relative to accidents occurring therein, incident to traffic, shall investigate the causes thereof, shall make recommendations to the commissioner of police, which shall be transmitted to the common council for necessary legislation to prevent and suppress such accidents, and shall, through educational publicity among the people of the city, seek to reduce the number of such accidents.

The Bureau conducts an all-year-round campaign through speeches before all kinds of groups, or by the exhibition of "safety" moving pictures before schools, churches and other organizations, and by continuous newspaper publicity of traffic accident statistics, etc. In addition to this, an intensive safety campaign, usually a week in duration, is held semi-annually.

In the sixth semi-an-

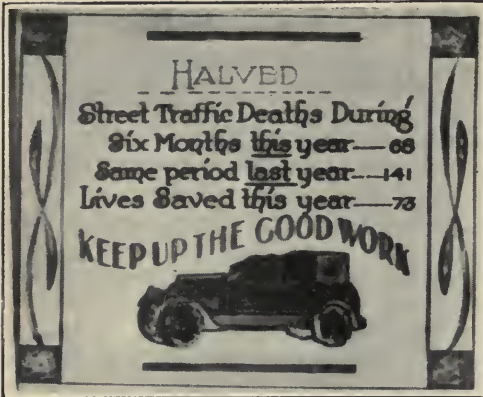
nual campaign held last June, over 25,000 persons, including school teachers, women's clubs, Boy Scouts, Camp Fire Girls, Detroit Automobile Club, clergy, Fire Department, etc., took an active part. Seven hundred open-air meetings were held; 8,700 talks were given; a daily parade including 25 wrecked automobiles was part of the program, and one million pieces of publicity were distributed, in addition to hundreds of large appropriate signs displayed in prominent points throughout the city.

One of the most important branches of the Bureau of Public Safety, a feature in accident reduction methods unique to Detroit, is the Accident Investigation Division. This consists of twenty officers under the direction of two detective lieutenants, who investigate thoroughly every traffic accident, following the same careful procedure pursued in the investigation of criminal complaints.

The old practice was to take into court only those persons involved in accidents that were witnessed by the police, except in instances where the victim was killed. The result was that 95 per cent of street traffic accidents were settled out of court, chiefly by accident insurance companies. The cases that were investigated were assigned to officers already sufficiently occupied with work on criminal complaints.



"HITCHING" BY CHILDREN IS THE CAUSE OF MANY ACCIDENTS. SAFETY INSTRUCTION CAN REDUCE CASUALTIES FROM THIS PRACTICE

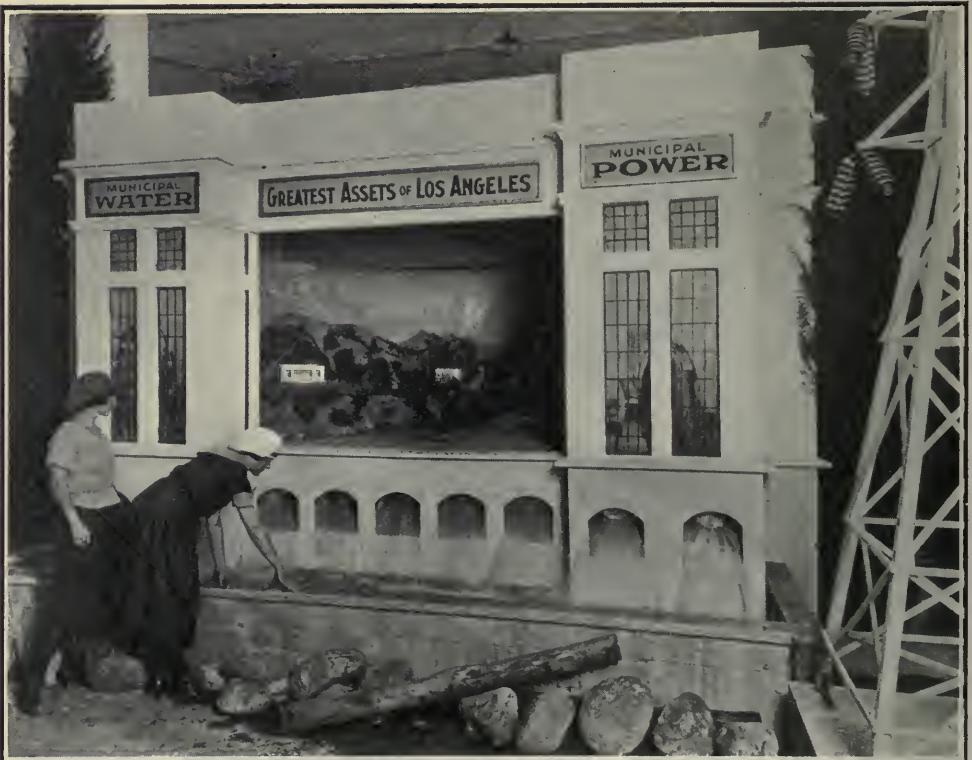


DISPLAYED ON A PROMINENT CORNER AND KEPT UP TO DATE, THIS SIGN KEEPS THE PEOPLE OF DETROIT INFORMED OF THE PROGRESS OF THE CAMPAIGN

Up to December 15, 1921, the Accident Investigation Division was responsible for the conviction in court of 931 persons, most of whom, under the former policy, would merely have referred their difficulties to the insurance companies. It needs no diagram to prove that immunity from punishment for the destruction of life and limb on the streets not only does not encourage care on the part of drivers, but tends to become an invitation for reckless driving.

Are the methods pursued by the Bureau of Public Safety making Detroit streets more safe? Up to December 15, 1920, Detroit had 239 street traffic deaths; for the same period of this year, street traffic fatalities were cut almost in two, reducing deaths from this cause to 131.

Attractive Publicity for the Public Utilities of a City



One of the displays attracting a maximum of attention from the 300,000 visitors at the Industrial and Trade exposition held recently in Los Angeles, Calif., under the auspices of the Chamber of Commerce, was installed by the City Bureau of Power and Light. It visualized the watershed of the Southern California metropolis, showing the city power-plants and the great aqueduct utilized in generating power. Figures were given of the costs, the power supplied and the returns to the city

The Economic Side of Anti-Siphon Traps in Plumbing Systems

By A. E. Hansen

Hydraulic and Sanitary Engineer, New York

CONSIDERABLE attention has been centered of late on the possibilities of reducing the cost of plumbing installations, and the theory has been frequently advanced that the use of anti-siphon traps would obviate the back venting now required by plumbing codes whenever $\frac{1}{2}$ S or bent tube traps are installed, and that a material saving in cost of plumbing work would result.

It is not the purpose of this article to dwell in any way on the scientific principles which underlie the merits or defects of unvented anti-siphon traps, nor to compare their efficiency or usefulness from a technical view-point with that of the vented bent tube traps, but it is the purpose to limit it entirely to the economic side of the question.

Perhaps the most recent typical example of a statement made publicly concerning the economy resulting from the use of anti-siphon traps, occurred during May, 1921, when testimony was given by a builder before Samuel Untermyer, Chief Counsel for the Lockwood New York State Housing Investigating Committee, to the effect that the installation of approved anti-siphon traps in a certain New York City building project would have reduced the cost of the plumbing installation about 50 per cent below that of the vented $\frac{1}{2}$ S trap system.

That the witness was thoroughly misinformed on the subject of his testimony will be clear to any one who reflects on the fact that the cost of the plumbing fixtures—that is, the water-closets, urinals, slop-sinks, wash-basins, bathtubs, kitchen sinks, and wash-tubs, of the hot and cold water-supply pipes and fittings, and of the soil and waste pipe systems remains the same whether anti-siphon traps or $\frac{1}{2}$ S traps with vents are used. The total cost of these items is from 90 to 98 per cent of the cost of the entire plumbing job. Furthermore, under the New York City Plumbing Code requirements, all water-closets must be back vented, there being no approved deep seal fixtures of this kind on the market. A separate vent stack would have to be in-

stalled, and therefore the only actual saving by the use of anti-siphon traps would be the short vent branches from the fixtures (other than water-closets) to the vent stack.

In order to satisfy myself on the real economy, if any, of anti-siphon traps as compared with $\frac{1}{2}$ S vented traps, I prepared a plumbing diagram of a typical three-story apartment house, reproduced herewith, which shows in full lines the soil, waste, and vent pipes required by the New York City Plumbing Code, if the approved anti-siphon trap is installed for all the fixtures (exclusive of the water-closets). In dotted lines are shown the additional vent pipes required if the $\frac{1}{2}$ S vented traps are used. I submitted this diagram to three responsible New York master plumbers, with the request that they estimate the costs of the $\frac{1}{2}$ S traps and their vent branches as shown in dotted lines, and also of the anti-siphon traps without vents, as permissible under the New York City Code. I asked them further to consult with each other, and to present to me, if possible, joint estimates which they would consider fair. These estimates were as follows:

UNVENTED PATENTED TRAPS			
	Patented		
6—1½-inch traps at \$ 7.00		\$42.00	
3—2-inch traps at 11.00		33.00	
	Total cost	75.00	
	plus 10 per cent profit.	7.50	\$82.50
VENTED ½ S TRAPS			
24 feet—1½-inch galv. pipe at \$.18		\$ 4.32	
9—1½-inch galv. mall. fittings at \$.30		2.70	
6—1½-inch brass ½ S traps at \$1.30		7.80	
3—2-inch brass ½ S traps at \$2.50		7.50	
1 day labor		10.00	
	Total cost	\$32.32	
	plus 10 per cent profit	3.23	\$35.55
Excess cost of unvented patented traps over vented ½ S traps			\$46.95

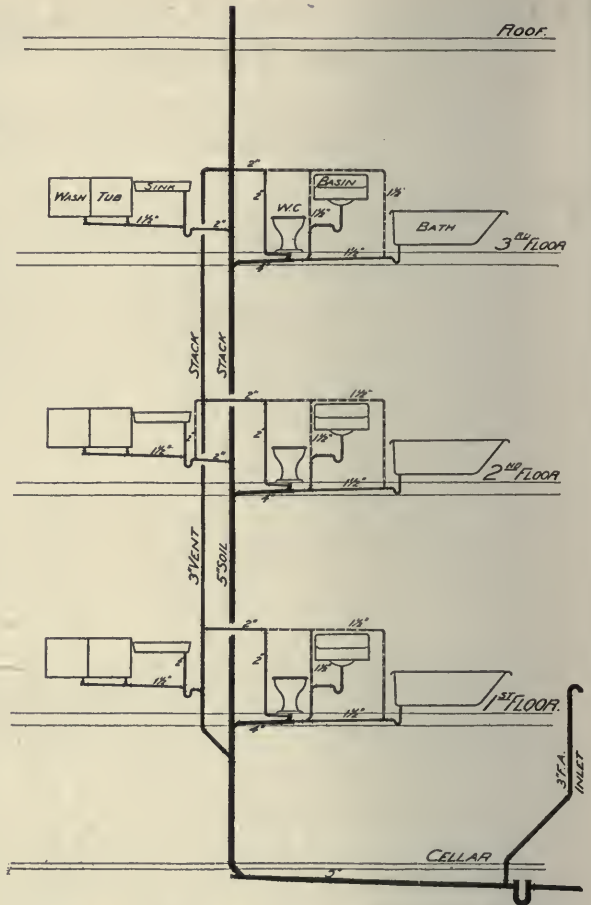
The estimates, it will be observed, show that the actual cost of the vented $\frac{1}{2}$ S traps to the owner, including a 10 per cent plumbers' profit, which I asked to have included, is about \$50 less than that of the unvented traps. I believe that the estimates are in-

tended to be proper and are deserving of confidence. Assuming, however, that the labor item of the vented $\frac{1}{2}$ S traps had been 200 per cent underestimated, there would still remain a balance of \$25 in favor of the vented $\frac{1}{2}$ S traps.

An analysis of the estimates of cost made by the plumbing contractors indicates that the materials required are correctly inventoried and priced, and that the labor to be performed consists of measuring and cutting 14 pieces of $1\frac{1}{2}$ -inch galvanized iron pipe to lengths not exceeding 3 feet; of cutting 28 $1\frac{1}{2}$ -inch pipe threads, and of installing 14 pieces of $1\frac{1}{2}$ -inch pipe and nine $1\frac{1}{2}$ -inch fittings. The measuring and cutting should reasonably consume not over $\frac{1}{4}$ -hour each, or $3\frac{1}{2}$ hours total; the cutting of 28 threads not over $1\frac{1}{7}$ -hour each, or 4 hours total; the installation of 14 pieces and 9 fittings not over $\frac{1}{3}$ -hour each, or 8 hours total. My own estimate of the total labor required would therefore be $15\frac{1}{2}$ hours, or, say, 2 days, instead of 1 day, or \$20 instead of \$10; but even under this condition the $\frac{1}{2}$ S vented traps are about \$36 cheaper than the unvented anti-siphon traps.

If the number of floors were increased, or the number of apartments per floor multiplied, each requiring a similar typical plumbing installation, this difference would, of course, become correspondingly greater. It is evident that the greater cost of the unvented anti-siphon traps is largely due to the high cost of the traps themselves. Seven dollars for a $1\frac{1}{2}$ -inch and \$11 dollars for a $2\frac{1}{2}$ -inch trap are big prices, which seem unwarranted except on the ground of patent or other fees.

From the representative example given, it is fair to conclude that the much-voiced opinion on the invariably lesser cost of unvented anti-siphon traps is not based on actual facts; there are, no doubt, certain individual cases, especially in alteration work or in small dwellings, in which this opinion will be found to be true, but the evidence shows, particularly where the plumbing is condensed near the vertical stacks and where toilet or bathrooms are located repeatedly alike and directly over each other,



PLUMBING PLAN FOR TYPICAL 3-STORY APARTMENT HOUSE

as is usually the case in apartment buildings, hotels, and office buildings, that the $\frac{1}{2}$ S vented traps are as cheap and perhaps cheaper than unvented expensive anti-siphon traps. It must be borne in mind in this connection also, that patented articles are unlimited in price and not subject to competition, especially where, as at present in New York City, only one such article is approved for use.

The chief item of cost in a back venting system is involved in the venting of water-closets, which are not made with anti-siphon traps; these must be back vented in any case, according to most of the plumbing codes.

The only additional vent pipes required, therefore, for the other plumbing fixtures consist of the short $1\frac{1}{2}$ -inch and 2-inch branches which connect the individual traps to the main vent stack or to the water-closet vent branch.

The Conference on the Standardization and the Elimination of Excess Variety of Vitrified Paving Brick

FIFTY-FIVE sizes and varieties of vitrified paving brick were eliminated by mutual consent at a meeting called in Washington in November by Secretary Hoover of the Department of Commerce. This conference of users and makers of paving brick was held at the suggestion of the National Paving Brick Manufacturers Association, which met with representatives of the Department of Commerce and with representatives of the U. S. Chamber of Commerce in a preliminary conference to determine the areas of standardization possible in this particular industry. As a result of this preliminary meeting, the manufacturers, under the general direction of the Department of Commerce, instituted a variety survey of the vitrified paving brick industry, which formed the basis for the meeting. A permanent committee to be known as the Committee on Simplification of Variety and Standards for Vitrified Paving Brick of the Department of Commerce, was created for the purpose of making other eliminations as time goes on that will be mutually acceptable to producer and consumer.

In addressing the Conference, Secretary Hoover said:

"The proposal that you are considering is no new idea in American industry, but it comes up in its best form on this occasion because it is inspired by the manufacturers themselves.

"One of the problems of the paving brick industry is the wide diversity of style in the demands made upon the manufacturers by engineers, that have increased their cost of production unnecessarily. This problem was brought to the Department of Commerce by the manufacturers themselves. We were asked if we could act as a center point to bring about some agreement in matters in general by which these varieties could be simplified and the cost of production materially decreased. Obviously, the consumer is the engineer, as he makes the specifications and directs the purchase. The manufacturers are helpless to come to any conclusion of this kind unless they can have the coöperation of the engineers who make the specifications and finally pass upon these matters.

"We have had some discussion with the manufacturers on this problem and they themselves have made through their engineers a

very careful study of this whole problem. The primary object of this meeting is to see how far an agreement can be reached for the simplification of varieties and how far the consumer will coöperate with the manufacturer in securing these varieties. There is little I can add, though I realize the importance of it. This is but one item which I hope will be extended in a general campaign among manufacturers in all directions. We have more problems of this kind and meetings going on with the help of the Chamber of Commerce in many industries. I believe it is the only practical way in which we can develop these essential groups in industry—that is, by the manufacturers' voluntary action, and if you gentlemen can come to some definite conclusion we shall be glad to give it such prestige as the Department can give. Obviously, if the engineers who direct the work in our cities, and the manufacturers will coöperate in reaching such a conclusion under the agency of the Department of Commerce, there can be no criticism of anybody engaged in this work, and if we can secure that coöperation we shall secure at the same time progress in the industry itself. I look upon this meeting with more than usual interest because it is the first of those processes that we have brought to this state."

After a thorough discussion of the report of the National Paving Brick Manufacturers Association, which contained an exhibit of the tabulation of actual shipments of paving brick of 66 varieties from 1914 to August 1, 1921, motions were made, seconded and unanimously passed by the Conference, reducing the varieties for consideration from 66 to 20. For the basis of discussion, a maximum size of brick, 4 inches in depth by 3½ inches wide and 8½ inches long, and a minimum of 3 inches deep, 3 inches wide and 8½ inches long are used. The following table gives the dimensions and types of the 20 varieties of brick decided upon:

Depth	Width	Length
Inches	Inches	Inches
3	4	8½
3½	4	8½
Repressed Lug Brick		
Inches	Inches	Inches
4	3	8½
3	3½	8½
3½	3½	8½
4	3½	8½
Vertical Fibre Lug Brick		
Inches	Inches	Inches
3	4	8½
3½	4	8½

Wire-cut Lug Brick (Dunn)		
Inches	Inches	Inches
3	3½	8½
3½	3½	8½
4	3½	8½

SPECIAL BRICK

Hillside Brick (Dunn)		
Inches	Inches	Inches
3½	3½	8½
4	3½	8½

Hillside Brick (repressed)		
Inches	Inches	Inches
4	3½	8½

Street Railway Brick		
Inches	Inches	Inches
3	3	8½ (Fillers)
3	3½	8½
4	3½	8½
4	3½	8½ (Stretchers)

Miscellaneous		
Inches	Inches	Inches
4	3¼	8½ (End Cut)
4	3¼	8½

As considerable debate ensued concerning further elimination, a committee was appointed for the purpose of considering the remaining 20 varieties. The committee reported the desirability of reducing the number of sizes so that all brick could be cut out of two clay columns, one 3 inches and the other 4 inches high. It was decided that present demands are such that there must be placed at the disposal of engineers brick to make a wearing surface either 3, 3½ or 4 inches in depth. In the smaller cities a 3-inch pavement is wanted; the larger cities require a 4-inch brick. The state highway departments, on the other hand, find 3-inch brick too shallow for their traffic, and 4-inch brick deeper than necessary, and are therefore specifying a 3½-inch depth. With these three depths considered imperative, the committee found it desirable to eliminate only nine of the varieties over and above those listed above, and therefore eliminated those in the following list:

Depth	Width	Length
Repressed Lug Brick		
Inches	Inches	Inches
4	3	8½
3	3½	8½
Hillside Brick (Dunn)		
Inches	Inches	Inches
3½	3½	8½
Street Railway Brick		
Inches	Inches	Inches
3	3	8½ (Fillers)
3	3½	8½
4	3½	8½
4	3½	8½ (Stretchers)
Miscellaneous		
Inches	Inches	Inches
4	3¼	8½ (End Cut)
4	3¼	8½

Some explanation of these eliminations is called for. A 4x3x8½-inch brick was eliminated, even though a fairly large number of that variety is used, because no hardship is imposed by asking the substitution of a 4x3½x8½-inch brick for it, as this

brick is of equal depth but ½-inch wider. No freight is saved on the 4x3x8½-inch over 4x3½x8½-inch.

A 3x3½x8½-inch brick was eliminated simply because it has never been widely used, and even though it is the only repressed size with which a 3-inch pavement can be built, it was believed that it would be a mistake to artificially encourage its use by naming it as a standard.

Coming to the eliminations in the various classifications of special brick, the committee has acted on the principle that as far as possible these varieties should be eliminated. Looking to the wide use of the Hillside type, however, it has deemed this use sufficiently important to retain one size in each of the Hillside classifications, that is, to retain only the 4x3½x8½-inch in Dunn Hillside brick, and the 4x3½x8½-inch in the repressed Hillside brick.

All other specials were placed in the non-standard class and therefore the following are eliminated in addition to those classes eliminated in the first discussion:

Depth	Street Railway Brick	Width	Length
Inches	Inches	Inches	Inches
3	3	3	8½ (Fillers)
3	3½	3½	8½
4	3½	3½	8½
4	3½	3½	8½ (Stretchers)
Miscellaneous			
Inches	Inches	Inches	Inches
4	3¼	3¼	8½ (End Cut)
4	3¼	3¼	8½

With all the eliminations mentioned above, the number of standard varieties would be 11 and the number of sizes 4, as follows:

Width	Depth	Length
Inches	Inches	Inches
3½	4	8½
3	4	8½
3½	3½	8½
3½	3	8½

The varieties, therefore, that would be retained are as follows:

Width	Depth	Length
Plain wire cut brick (Vertical Fibre Lugless)		
Inches	Inches	Inches
3	4	8½
3½	4	8½
Repressed Lug Brick		
Inches	Inches	Inches
3½	3½	8½
3½	4	8½
Vertical Fibre Lug Brick		
Inches	Inches	Inches
3	4	8½
3½	4	8½
Wire-cut Lug Brick (Dunn)		
Inches	Inches	Inches
3½	3	8½
3½	3½	8½
3½	4	8½
Hillside Lug Brick (Dunn)		
Inches	Inches	Inches
3½	4	8½
Hillside Lug Brick (Repressed)		
Inches	Inches	Inches
3½	4	8½

A Public Laundry in a Bath-house

The Interesting and Successful Experience of Baltimore, Md.

By Robert F. G. Kelley

Secretary and Superintendent, Free Public Bath Commissioner, Baltimore, Md.

THE first thought that comes to your mind will probably be, "Why the need of a public laundry?"

I am going to tell you of twenty-one years' experience that Baltimore has had, and perhaps, as the story unfolds, you may see that there was such a need in Baltimore, and is such a need in the average large city of to-day.

About the year 1899, when the Public Bath Commission of Baltimore was about beginning the erection of the city's first in-door bath-house, several of the Commission went to Philadelphia to make a study of the public laundry there. We had understood that women brought their home washing and ironing and did it in rooms set aside for that purpose. After a thorough investigation, the plan seemed good, and in Baltimore's first bath-house, built in 1900,

this feature was incorporated. This house, located at 131 South High Street, is in a thickly congested neighborhood, consisting largely of people of foreign birth, and is not far from the public wharves.

In making the first schedule, we allowed four days a week for women to do their family wash, and two for men to do their personal laundry. After several years of experiment, it was found that this schedule had to be altered somewhat, as the demand from the men was much larger than that from the women.

By the year 1920 the type of population had changed, and we found that comparatively few women were doing their family wash, while on the days set aside for men the laundry was much congested, on some days as many as one hundred men being present. It was then decided to make it



WOMEN'S DAY AT THE PUBLIC LAUNDRY, WALTERS BATHS NO. 41, BALTIMORE, MD.

exclusively a laundry for men, and the large patronage, nearly 7,000 in 1920, proved that this was a wise move. For the first four months of 1921, because of unemployment, the attendance was much larger than ever, a total of 3,875 having been recorded, an increase of 1,585 over the corresponding months of 1920.

In order to give some idea of the scope of the work, I am now going to take you through the laundry with John Smith, who is desirous of cleaning up.

John walks into the bath-house, goes up to the window, and hands the attendant 10 cents. For this he receives a towel, a half-ounce piece of toilet soap, and a ticket. Another attendant shows him to a cabin, where John proceeds to take a bath.

After his bath he puts on his trousers and coat; the rest of his belongings he carries on his arm. He then presents his ticket to an attendant, who gives him about one-third of a bar of laundry soap, and John goes down to the laundry.

Here he is assigned to a set of laundry tubs with plenty of hot and cold water, and he begins his family wash. He may think that his coat and trousers also need washing; if so, he does it. Perchance he may have brought a blanket along; others have done so. When he has finished his washing, he wrings out his clothes and places them in racks in a drying-room.

He will then sit on a bench for about a half-hour, pull out his pipe and smoke, while his clothes are drying. Perhaps he may discuss the topics of the day with some of his neighbors. When his clothes are dry, he proceeds to dress, and then walks out with a smile on his face, a clean man, and, we think, a better man.

Who is John Smith?

He may be an oyster dredger, just up from a long trip of hard work down the bay. Or perhaps he is living in one of the cheap lodging-houses near-by, doing odd jobs and making just enough to keep body and soul together. Sometimes John is a cripple, who must lean on his crutches at the laundry tub to wash his clothes. Just as likely as not, he may be a tramp passing through, who has heard from another of the chance to clean up.

Sometimes he is sent from one of the Rescue Homes by the manager, who requests that John have a chance to clean up.

In this case, and many others, the 10 cents is missing, but John is not turned away on that account, and receives the same attention. During the late war, he was represented in many cases by a uniformed man, who did not always have the opportunity at camp to clean up. In his case no charge was ever made. It is a touching scene to look at forty or fifty John Smiths washing their soiled underclothing. Like the Indian coolies, they carry all their earthly belongings on their backs.

From a City-wide Congress Report on Baths, published several years ago, we quote the following:

"No more far-reaching philanthropy exists in our midst than this splendid means to health, comfort and cleanliness. As we watched a party of sturdy oyster dredgers emerge from the building (Walters Baths No. 1) last Saturday, immaculate, and with heads erect, themselves and their clothes freshly laundered, we wondered if Mr. Walters' other princely benefaction, the Art Gallery, was more highly appreciated in its effects."

The Women's Laundries

Encouraged by the success of the laundry at Walters No. 1, in our next four bath-houses we provided laundry facilities. As these were located in residential neighborhoods, their use was confined to women. Because of large patronage in two of these houses, it was necessary afterwards to enlarge the facilities.

In order that you may better understand the work, I am going to take you through one of the laundries with Mrs. Jones.

Through a neighbor, or perhaps through an advertising card which she has found under her door, she decides to give the laundry a trial. Gathering up her family wash, she proceeds to the bath-house and finds that there is a side entrance to the laundry room. Here she is greeted by a matron, who gives her a small numbered card and assigns her to a set of tubs.

By consulting this card, she finds she can purchase soap, starch and bluing at the same prices she would have to pay at the corner grocery. She then proceeds to draw her steam and boil her clothes, afterwards using the wringers attached to the tubs. The clothes are now ready to be dried and she is assigned several racks in the drying-room. In a short time the clothes are dry and she is given an ironing board and several irons, so that she can complete her job.



AT THE WALTERS BATHS NO. 16, BALTIMORE, MD., THE MEN CAN DO THEIR PERSONAL LAUNDRY

Work done, the card is consulted, and she finds that she has spent four hours in the laundry—cost 20 cents, bar of soap 6 cents (if any is left over, she takes it home), bluing 1 cent, starch 1 cent, making a total of 28 cents. For this sum she has been able to do a large family wash. In addition, she has worked in a pleasant room, avoided many discomforts which she would have had at home, and has met some neighbors and had a nice chat.

I had almost forgotten to say that Mrs. Jones took her two children, aged three and five years, with her, and while she was washing and ironing they were in the playroom, a small section set aside for that purpose, having a good time with some toys.

Why was it necessary for Mrs. Jones to go to the public laundry? Could she not have done her washing at home and saved herself trouble and expense? To the dweller in the average large city this question would surely seem superfluous.

Perhaps Mrs. Jones lives in two or three rooms in a tenement, which could hardly be called a home; or, if she is fortunate enough, perhaps in a small house, which, however, contains no yard for drying purposes. Try to imagine her under situations like the above: building her fire, drawing her water and pouring it into a galvanized tub, heating her water, then bending over

and rubbing her clothes, then the hand wringing, then the placing of the clothes somewhere to dry, afterwards the ironing in a hot room. Surely wash day must be a torture under conditions like these.

In many cases, young women boarding in the city, who have no other means of keeping their clothing clean, take advantage of the facilities at the laundries.

By far the largest class that use the laundry are the colored people who patronize Walters Laundry No. 3, which is set aside for their exclusive use. These colored women live in alleys or in crowded tenements in the larger streets. They are typical of the colored population in Baltimore—house servants, wives of laboring men, etc., and to no class do the public laundry facilities bring more advantages.

For the year 1920 the attendance at the laundries was as follows:

Walters No. 1—For men only.....	6,799
Walters No. 2—For women only.....	3,737
Walters No. 3—For colored women.....	13,998
Walters No. 4—For women only.....	3,943
Greenm't Ave—For women only.....	2,478

Total 30,955

Dr. Donald B. Armstrong, of New York, in an article that appeared several years ago in *THE AMERICAN CITY*,* speaking of laundries, wrote as follows:

* December, 1913, page 526.

"There are about fifteen such institutions in America, five of which, and by far the best of them, are in Baltimore, Md."

He closes his article with these strong words as a plea for the establishment of similar places in New York City:

"The public wash-house, like the public baths, finds its chief justification in the fact that it gives to the people an opportunity to learn how to be clean, and makes it possible for them to appreciate the value of health and decency in being physically clean. Physical cleanliness enhances their moral and spiritual tone. They will recognize more acutely their housing defects and will demand even more energetically than at present that equipment for the home which they have learned to use and value outside, and the importance of which, for the preservation of health and the maintenance

of decency, they have been educated to appreciate."

In conclusion, we should like to make the following suggestions to city officials contemplating installing laundry facilities:

First, by all means a small playroom should adjoin the laundry, where mothers can leave their children while doing their washing.

Second, in many cases advertising is necessary at the beginning. At several of our houses we gave away cards which entitled the bearer to use of the laundry twice, free of any charge.

Third, employes should be selected with care, as a poor employe can kill a laundry.

A Substantial Highway Sign-Post

WITH the large number of highways extending north and south, east and west on this continent, promoters and highway departments are aiming to produce individuality in the sign-posts on certain highways. The sign-post shown in the accompanying illustration is one of many which have been placed at mile intervals along a western route. It is not radically different from many others, but it does typify good, substantial design, which gives it individuality. The post is of reinforced concrete, 4 by 6 inches, and the slabs 2 inches thick, 30 inches high and about 40 inches long. The whole post is securely anchored in a concrete base with the top trowelled off, and the edges squared so that in case of erosion about the base it will not have a jagged and run-down appearance.

The letters and figures are made by imbedding the type in the soft mortar. This leaves each symbol in the form of a depression, and after the sign is painted it will keep its keen contrast much longer than if the symbols were flush with the rest of the slab. Special moulds are easily made and the signs turned out at a slight cost.



Courtesy Alpha Portland Cement Company

A REINFORCED CONCRETE POST

The Central Heating Plant—A Public Utility

Chicago Demonstrates Value of Recording Flow Meters in Distributing Heating Load, and Reduces Smoke Nuisance

By J. C. Butler

THE story of central station heating in Chicago, as carried on by the Illinois Maintenance Company, contains several points of interest to municipalities: first, it might be considered in smaller communities as a municipal enterprise; second, the use of recording flow meters in checking up the use of steam by different buildings makes it possible to distribute the load economically; third, the installation of either privately or municipally operated central heating plants is a great factor in reducing the smoke nuisance.

Central station heating in Chicago had its beginning many years ago when steam service was supplied to small buildings adjoining a larger building in the same block, the service being given by the larger as an aid in overcoming the smoke nuisance from the smaller boiler plants. It was on this basis that the Illinois Maintenance Company, as well as many private building owners, began to distribute steam in Chicago, the piping being run in the basements of buildings in the same block as that in which the steam generating plant was situated, thereby eliminating the expense of placing piping in the city streets and alleys.

It has been only within the past few years that the tie lines have been installed between steam generating plants, thereby protecting the service and making it possible to effect certain operating economies that could not have been obtained otherwise. The system, as now operated by the Illinois Maintenance Company, comprises six steam generating plants, together with buildings and customers in thirteen city blocks in the loop district of Chicago. This is only a part of the entire system operated by the company. The benefit of such a system of steam distribution is great, as it is possible to supply a total of 49 steam customers from 6 boiler plants, 18 of whom formerly operated their own individual boiler plants, and 26 of whom would have had to install boilers of

their own had not the outside steam service been available. In this way it has been possible to concentrate the smoke to a maximum of 6 stacks, instead of a possible 44. The fuel is burned in a more efficient boiler plant located in the larger buildings with stack extending above the surrounding buildings, which it would be impossible to do in each individual building.

In a system of this kind it is possible to reduce or to increase the number of boiler plants in service at any one time as the seasons change; all the load is carried from one plant during the summer months, and the other plants are cut in or out as the case may be, depending on the outside temperature conditions. Before connections were made between the boiler plants of the system, the engineer in each plant knew the character of his load and could govern his plant-operating conditions accordingly, but under the present system it is necessary to have a load dispatcher who notifies the engineer as to what procedure he shall follow.

Handling the Load

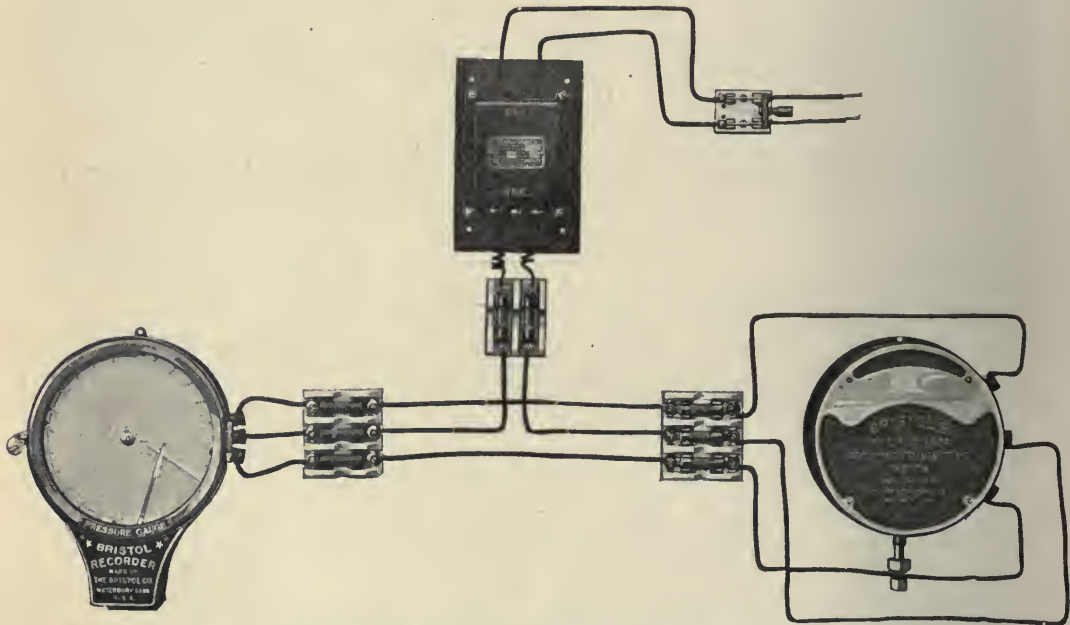
With boiler plants and customers scattered over 13 city blocks, it was a problem as to the best method of obtaining the information necessary for the proper handling of the load conditions and boiler-plant operation. Consequently, a switchboard containing 14 recording and integrating Republic flow meters and two Bristol long-distance recording pressure-gages was placed in the office of the chief operating engineer, and this, together with the telephone, was considered sufficient for the operation of the system.

The accompanying illustration gives a series of curves showing the average load on the system for each hour of the day for different outside temperatures. From this it can be seen that during the summer months, when the temperature is 70 degrees Fahrenheit or warmer, the average day load

is approximately 39,000 pounds of steam, but the night load is 15,000 pounds of steam and the load factor for the months of June and July is approximately 50 per cent. A mean daily outside temperature of 60 degrees Fahrenheit introduces short-hour heating, by which the customer has heat on in the morning for three or four hours and then cuts it off for the remainder of the day. It is during such periods that the load dispatcher must watch his load carefully and get his boilers in and out of service so as to

tensions and additions, lead-covered telephone cables were run along the main steam lines, openly or in conduit, depending on their exposure to injury. Potheads and terminal boxes were placed at all important points so as to make it easy to connect in any additional meters or gages.

The steam generating plant in the Edison Building being the central plant and the one that is operated at full capacity most of the time, meters were placed on the individual boilers. All other meters were placed



TYPE OF LONG-DISTANCE RECORDING DEVICE USED IN CHICAGO CENTRAL HEATING PLANT

reduce the plant losses to a minimum and still keep up the required steam pressure, which is quite essential where hydraulic elevator equipment is on the system.

As the weather becomes colder, 24-hour heating is required and the load curve flattens out, giving a high load factor, usually 70 per cent for the months of December, January and February. The average yearly load factor for the system is approximately 33 per cent, the maximum half-hour load being at a rate of 220,000 pounds of steam per hour for an annual-steam consumption of 633,700,000 pounds.

The Metering System

To make the metering system as flexible as possible and also provide for future ex-

on main steam lines or service connections with large loads. In this way the necessary information can be obtained with a minimum of instruments. The instruments are so grouped on the meter board of the chief operating engineer's office that the load dispatcher can make his necessary calculations and decisions with the least possible delay. As all the steam is transmitted at a pressure of approximately 120 pounds and is used for operating pumping equipment, as well as for cooking, refrigeration, heating water, heating, etc., it is quite essential that a uniform pressure be maintained. For the purpose of checking the pressure and keeping a record of it, long-distance electrically operated pressure-gages are connected at two of the more critical points in the system,

and the recording instruments are placed where they will be in view of the load dispatcher. The recording instruments are all equipped with 7-day clocks, and 7-day charts are used. The clocks on the flow meters operate electrically from the master clock of the building. This eliminates the winding of clocks by hand, and the 7-day

charts reduce the changing of charts to a minimum. For accuracy the recording instruments are read each hour during the critical periods of the day. The load dispatcher collects and compiles all data, posting the load curves hourly, so that the chief operating engineer may know what is going on in the system at any time.

The Meaning of Good Roads



POOR ROADS MEAN HARD HAULING FOR LIGHT LOADS AND THE IMPOSSIBILITY OF HANDLING HEAVY LOADS

Short-sighted financial policies never provide long stretches of modern highway.

Don't expect roads over night. Your engineer cannot substitute a magic wand for his blue-print.

Highway News Digest.



THE SMOOTH HARD-SURFACED HIGHWAY INCREASES TRANSPORTATION FACILITIES AND IMPROVES PROPERTY VALUES

The Board of Appeals in Zoning

By Edward M. Bassett

Counsel of the Zoning Committee of New York

THE main difficulty in establishing a zoning plan is to make it effective and at the same time avoid arbitrariness. Human wisdom cannot foresee the exceptional cases that can arise in the administration of a zoning ordinance. The strict word of the law may sometimes be the height of injustice. No zoning ordinance standing by itself can provide for the proper adaptation of the spirit of the law to each exceptional case. On this account, in the administration of building laws in general and especially zoning ordinances, it has been found desirable, even necessary, to create an expert board, usually called a board of appeals, to adapt the application of the law to particular exceptions so as to carry out the spirit of the law instead of allowing it to be arbitrary or confiscatory.

A city cannot create such a board without authority from the state legislature to do so. Therefore, any state enabling act to authorize cities to adopt zoning ordinances should contain a provision empowering the city to appoint such a board and outlining its functions. Merely to say that a city can appoint such a board to do what is just or lawful is not enough, and probably such a statement in the law gives the board no power whatever. The state enabling act must either prescribe the rules that it must follow or, better yet, empower the city council to assign to it in the ordinance certain specified classes of exceptional cases for it to decide. The council should also prescribe a rule for it to follow in deciding each class of cases.

Such a board should be given three distinct fields: first, to rectify errors in granting or refusing permits; secondly, to pass on exceptional cases where specified in the ordinance itself; and third, to vary the literal requirement of the law where unnecessary and excessive hardship is caused and the intention of the law is equally accomplished by an alternative method to be prescribed.

The state enabling act should provide for the review of the decisions of a board of appeals by the court. This court review,

however, should not be a substitution of the judgment of the court for the judgment of the board of appeals. The findings of an expert board should not be interfered with by the court unless the board has exceeded its lawful powers or misinterpreted the law or abused its discretion. In states where under such circumstances the courts will not assume this position, the enabling act should require it.

Personnel of the Board

A board of appeals may well be composed in part of officials whose duties bring them in touch with buildings and their use throughout the city, and in part of non-officials expert in such fields as design, construction, fire protection or sanitation. As a rule, the official who issues permits in the first instance should not be a member of the board of appeals, because it is better that he should not be compelled to act on his own prior decisions. Neither should a member of the city council be on the board, because of the difficulty of his acting as a legislator in one position and as an administrator in the other.

Inasmuch as exceptional situations only come before a board of appeals, there is always a presumption that the applicant should observe the strict letter of the zoning ordinance just the same as all other citizens. Therefore, if an exception is to be made in his case, the vote of the board should be greater than a mere majority. In other words, an applicant desiring an exception should be able to convince a large proportion of the board. On the other hand, it should be possible for a mere majority to refuse to make an exception, so that there may be a decision of denial on which the applicant can ask for a court review. This distinction has been made.

Separate Functions of the City Council and the Board of Appeals

States and cities will not go far afield when they came to define the functions of the council and the board of appeals if they will remember that the council is the city legislature and as such has entire control

over the zoning ordinance and maps. The board of appeals should have no control over the ordinance and maps but should pass on specific permits arising under the provisions of the ordinance and maps. The council then has its own field and the board of appeals its own separate field, and these do not overlap. The council does not adjudicate on a particular building or the use of a particular building. The board of appeals passes on nothing but particular buildings. The council impresses a certain quality on the land itself. The board of appeals in certain exceptional cases varies the application of the ordinance for a building or use which may temporarily occupy the land.

Complaints will always be made against

boards of appeals, and probably such boards will always abuse their discretion once in a while. If, however, a city administration is not competent to establish a good board of appeals, it probably is not competent to administer a zoning ordinance fairly. An occasional wrong decision by a board of appeals is of less importance to the community than the unrelieved arbitrariness of an iron-clad ordinance which, first in one particular application and then in another, may be criticized by the courts. A board of appeals should ameliorate the exceptional instances where alone lies the danger to the entire zoning plan, for, as the courts have repeatedly said, the integrity of a zoning plan under the police power depends on its not being arbitrary.

A Narrow Parkway That Was Abandoned

SOMERVILLE, MASS., has abandoned the attempt to have a parkway of a mile or more in length along Broadway, from the Boston line to the top of Winter Hill. The parkway has been in existence nearly ten years, and has been declared a failure. It was figured out that Broadway was wide enough so that a narrow strip in the center of the street between the tracks of the double-track street railway could be utilized for the growing of grass and small shrubbery, adding to the beauty of the city. Finally, the rails were set 9 feet apart, and a 3-foot strip between them was sown to grass and planted to shrubs.

From the first, the jay-walkers disregarded it, crossing the street where convenience dictated, regardless of a parked strip. Some teamsters, some drivers of pleasure wagons—though the latter have disappeared, motorists have succeeded them—disregarded the attempt to make a beauty spot. Then the street railway used salt to

keep away the snow and ice in winter, and more or less oil was deposited there. All these things spoiled the grass and shrubs.

The question was whether the city should make another attempt, rebuild the parkway and employ policemen enough to keep it protected inch by inch, or abandon it. It was abandoned by vote of the city government, and the remnants of grass and shrubbery have been replaced by broken stone. It is said that the city fathers would like to see three or four feet of that space added to the width of Broadway, where automobile traffic has become heavy since the parkway attempt began.

This experience of Somerville suggests that in planning for parkways it will be well to make them wide enough so that the street will have the appearance of being two separate streets instead of one street, and that the city might well go to the expense of setting curbs to protect the parking from the incursions of vehicles.

A Correction

In the article "A Survey of the Salaries of Police and Police Departments," by Lucius H. Cannon (*THE AMERICAN CITY*, December, 1921, page 459), appeared the statement that patrolmen in Harrisburg, Pa., receive \$750, the smallest salary paid to patrolmen in any of the

70 larger cities of the United States. This is incorrect; police constables, first grade, receive \$1,500; second grade, \$1,440. These figures have obtained since January 1, 1920; before that, the annual salary paid to patrolmen in Harrisburg was \$1,380.

The Municipal Apartments of Paris Help Solve the Housing Problem

By Herbert M. and Lilliane R. Davidson

LIKE other cities, Paris has for a number of years been troubled by a lack of clean, cheap dwellings, but there are at present completed and ready for occupancy fourteen municipally owned and operated apartment houses containing nearly 2,000 apartments.

The municipal apartment house project in Paris was inaugurated in 1913, when a bond issue of 200,000,000 francs was voted to construct houses in Paris which should combine the three qualities of sanitation, beauty, and economy. A fair was held to investigate materials and construction which would be at the same time cheap, durable, healthful and comfortable. A contest was instituted in which architectural plans for the houses were selected. Five prizes were awarded, and it is according to the model which won first prize that the first group of fourteen houses has been built.

Next, large strips of land were set aside from the city's parks and promenades, chosen in such a way as not to interfere with the beauty and adequate size of any public place. Of these, a strip on Avenue Emile Zola was chosen as the site for the first group.

The war of course interrupted this program, but the housing crisis which followed

the war called for its immediate revival. Work was started in spite of the greatly changed financial conditions. It was originally planned that the city should get back the sum invested in 75 years. Under present conditions this is believed impossible, as the cost of construction has increased from three to four times. At the time of the Armistice, Paris had to choose between abandoning her housing project and taking a severe loss. She chose the latter course. In spite of a slight additional sum raised and the scheduling of rents rather higher than those planned originally, Paris will have to meet a large bill on the project. Under present conditions it will take the houses from one hundred to one hundred and twenty-five years to pay for themselves.

Now how are these apartment houses rented? First of all, preference is given to workmen and the small-salaried clerical class. Although it is believed that, in general, economic laws will operate to send the renter of small income to these cheap houses, inquiry is made as to the status of the proposed tenants, and apartments are rented only to those who could not otherwise afford such pleasant and hygienic lodgings. Secondly, these apartment houses are designed boldly and unashamedly to

favor families with children, and the more the merrier. Two-thirds of each house is reserved for families with four children under 16 years, and for every child under 16 belonging to a renter of one of the municipal apartments, the fortunate father is allowed a rebate on his rent. Families without children must be content to pay a higher proportional rent for smaller, less desirable apartments. Finally, the rents charged are at least one-third less than those charged in privately



OLD BUILDINGS OF THIS SORT ARE BEING TORN DOWN TO BE REPLACED BY MODERN MUNICIPAL APARTMENTS



THOROUGHLY MODERN APARTMENT HOUSES, BUILT BY THE MUNICIPALITY, ARE HELPING TO RELIEVE THE ACUTE HOUSING SITUATION IN PARIS

owned houses of somewhat poorer grade. The range probably will be from 300 to 800 francs a year. The maximum charge permitted under the law is 1,038 francs a year.

The prize-winning plan from which the houses are being built is an admirable piece of work. Every apartment opens on the street, giving not only ventilation but a view to every tenant—all of which is only another way of saying "all outside rooms." There are only two main entrances, making necessary only two *concierges*, which is French for janitors. Halls, which customarily take up great quantities of room in France, are reduced to a minimum.

There are five types of apartments, varying from the largest, containing three bed-

rooms for children, one of them double, one parents' room, one kitchen and one dining-room, to the smallest, comprising only one room with a kitchenette.

In addition to the group of apartments completed in July, construction plans include a new group of five apartment houses containing 470 flats each. These will cost from 17 to 25 million francs each to build.

With future building in mind, the city of Paris has recently held in the Zoological Buildings in the Bois de Boulogne another exhibition of methods and materials of construction, with a view to finding some means of erecting houses more economically still, and especially of finding some cheaper building material than brick and stone.

Make no little plans. They have no magic to soothe men's blood and probably themselves will not be realized. Make big plans, aim high in hope, and work, remembering that a noble logical diagram once recorded will never die.—Lancelotti Burnham.

Motorized Municipal Equipment



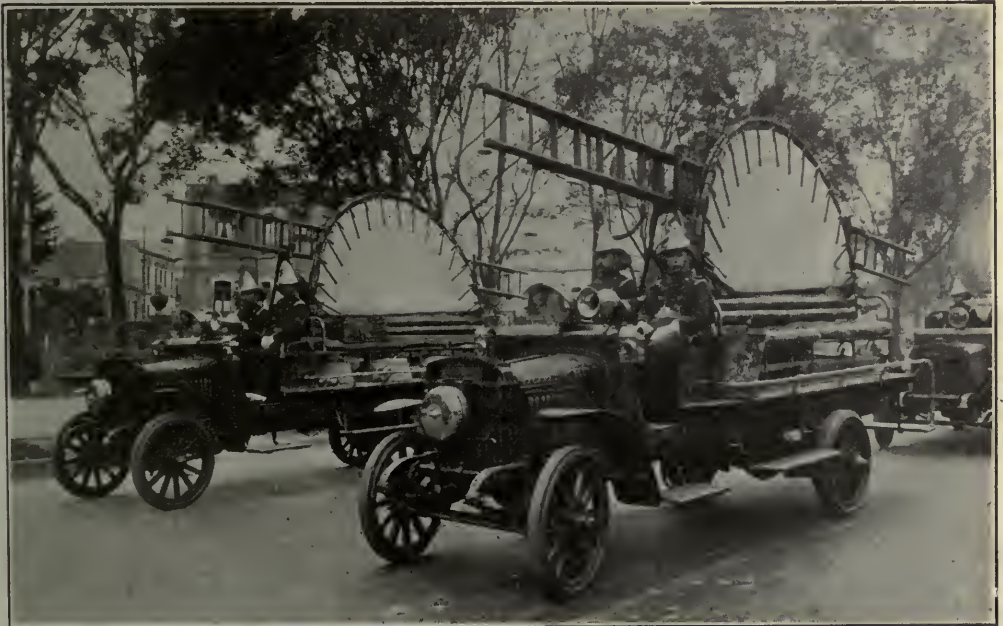
A STANDARD TRUCK USED FOR HAULING BALLAST BY THE DEPARTMENT OF STREET RAILWAYS, DETROIT, MICH.



A MACK TRUCK ENGAGED IN HEAVY HAULING IN BUENOS AIRES, ARGENTINE



THE CLEVELAND, OHIO, FIRE DEPARTMENT USES THIS 3-TON WHITE TRUCK TO HANDLE THE FIRE ALARM TELEGRAPH CABLE AND OTHER DEPARTMENT HAULING



TWO ATTERBURY FIRE TRUCKS RECENTLY PUT INTO SERVICE BY MEXICO CITY, MEXICO. THE DEPARTMENT IS ALMOST COMPLETELY MOTORIZED WITH APPARATUS OF AMERICAN MANUFACTURE

Effective Street Lighting

The distinction accruing to a street lighted with King Standards has a particular value. The street is attractive by day and night. Let our Engineering Department assist you in solving your street, boulevard and park lighting problems. ∴ ∴

KING MFG. COMPANY
53 W. JACKSON BLVD. CHICAGO, ILL.



Chamber of ******* Commerce Activities in Public Affairs

"It Couldn't Be Done—But They Did It"

WILKES-BARRE, PA.—With a critical housing shortage on one hand and prohibitive building costs on the other, the Greater Wilkes-Barre Chamber of Commerce has put across another one of those "can't be done" achievements by erecting forty-seven houses at prices that are actually down to the 1914 level.

The funds needed were approximately a quarter of a million dollars. Business men agreed to furnish one-half, and an old line insurance company to lend the other half on a first mortgage. A Community Housing Corporation was formed to finance and manage the proposition. A tract of land was purchased on the banks of the Susquehanna overlooking the Wyoming Valley and subdivided into lots and streets, so grouped and arranged as to avoid the usual line-up of "company houses." Great pains were taken in selecting the type of houses. The single six-room, two-story house predominates, with a few double houses, some with seven rooms to a side, others with six rooms on one side and five on the other. The construction is three-ply stucco on metal lath, back-plastered, full cement basement, hot air heat, slate roof, all modern conveniences, sidewalks in and street graded. The cost of these homes ranges from \$4,600 to \$5,300.

The plan of payment at absolute cost to the buyer is as follows: A 20 per cent payment down was required. On completion of the home, monthly payments begin at the rate of about 1 per cent of the balance due. This is applied on both interest and principal and also takes care of taxes and insurance, all being handled through the Housing Corporation, which retains title until the last payment is made. Some, of course, paid all cash down, but most of the buyers took advantage of the eleven-year term in which to acquire a home on pay-

ments which were but little more than the same house would rent for.

An intensive publicity campaign through the newspapers was used, with a sketch of the houses, single and in groups. An exhibit was also placed in store windows and in the Chamber of Commerce Auditorium.

Most of the houses were sold before the first shovel of dirt was turned, and this later event was made the occasion for a formal ceremony which marked the actual beginning for many of the dearest spot on earth—a home.

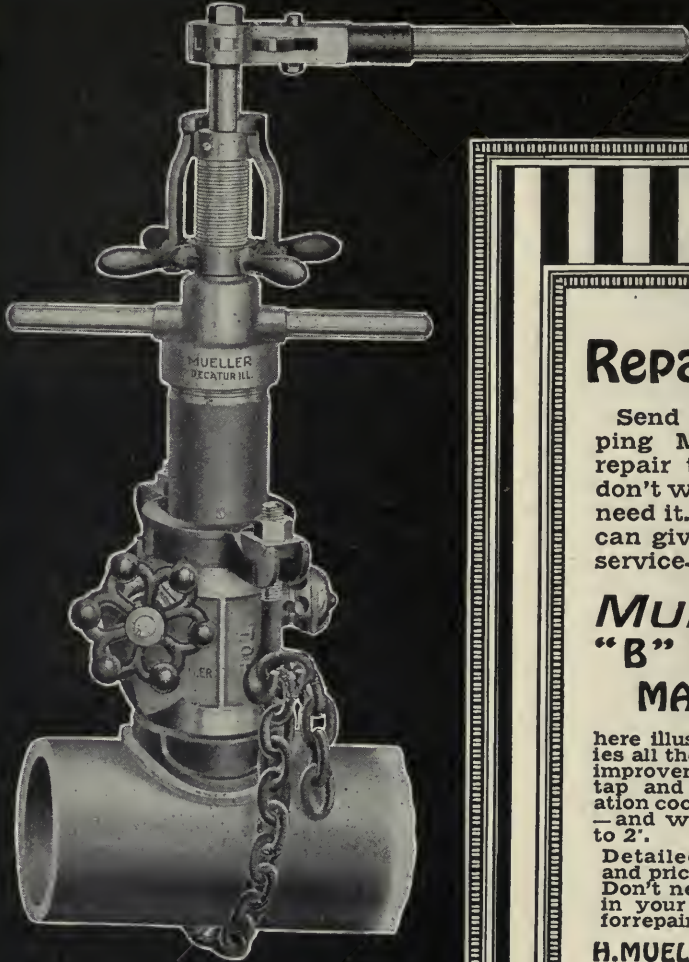
The whole building contract was given to one contractor, who figured on the closest



A SINGLE-FAMILY HOUSE BUILT BY THE WILKES-BARRE, PA., COMMUNITY HOUSING CORPORATION

possible margin and made the statement that it would cost an individual at least \$1,000 more to reproduce one of these houses than the price at which they were offered by the corporation. This was verified later by the insurance company in valuing the property for the purpose of placing its loan, and also by the fire insurance companies in underwriting the fire risk.

The real purpose of the undertaking, that is, the stimulation of home building, was realized before the publicity campaign was over, as was evidenced by the promotion of



Repair Time

Send in your Tapping Machine for repair this month—don't wait until you need it. **MUELLER** can give you quick service—*Now*.

MUELLER "B" TAPPING MACHINE

here illustrated, embodies all the new **MUELLER** improvements. It will tap and insert corporation cocks from $\frac{1}{2}$ ' to 1'—and will tap *only* up to 2'.

Detailed descriptions and prices on request. Don't neglect sending in your old machine for repairs—right away.

H. MUELLER MFG CO.
Decatur, Illinois

Water, Plumbing, & Gas
Brass Goods & Tools

New York City, 145 W. 30th St.
Phone Watkins 5397

San Francisco, 635 Mission St.
Phone Sutter 3577

Sarnia, Ontario, Canada

Mueller Metals Co., Port Huron, Mich., Makers of "Red Tip" Brass Rod; Brass and Copper Tubing; Forgings and Castings in Brass, Bronze and Aluminum; Die Castings in White Metal and Aluminum; also Screw Machined Products.



A FEW DOUBLE HOUSES WERE PUT UP BY THE WILKES-BARRE HOUSING CORPORATION. THE SUCCESS OF THIS CORPORATION HAS ENCOURAGED PRIVATE BUILDING

several home-building projects through real estate agencies, which up to that time had taken the stand that "there ain't no such animal," but were willing to venture after the way was paved.

This experiment in solving the housing problem simply shows that with unity of purpose, concentration of effort and cooperation in handling the project on a large scale, homes can be placed in reach of the average wage-earner, who is unable to cope with the situation single-handed.

C. H. HALL, Civic Department,
Greater Wilkes-Barre Chamber of Commerce.

Chamber Leads Good Roads Campaign

SIoux CITY, IOWA.—With the completion in November of the concrete road from Sioux City to Merville, the Sioux City Chamber of Commerce realizes the first fruits of its labor of three years ago. It marks the first step in Woodbury County's three-and-a-half-million-dollar road system, for which bonds were voted in 1919. The length of this piece of road is 14 miles from the city limits of Sioux City to Merville, Iowa, and connects with Sioux City's 110 miles of paved streets and highways.

The surface is of the one-course reinforced concrete type. It is 8 inches through, resting on a rolled subgrade, and has a 2-inch crown. It is 20 feet wide and has a 1-foot integral curb on each side, raised 3 inches. The reinforcement consists of half-inch steel bars laid 6 feet apart, crosswise, with three longitudinal bars. They are 2½ inches below the top of the concrete.

A useful feature is being added by the

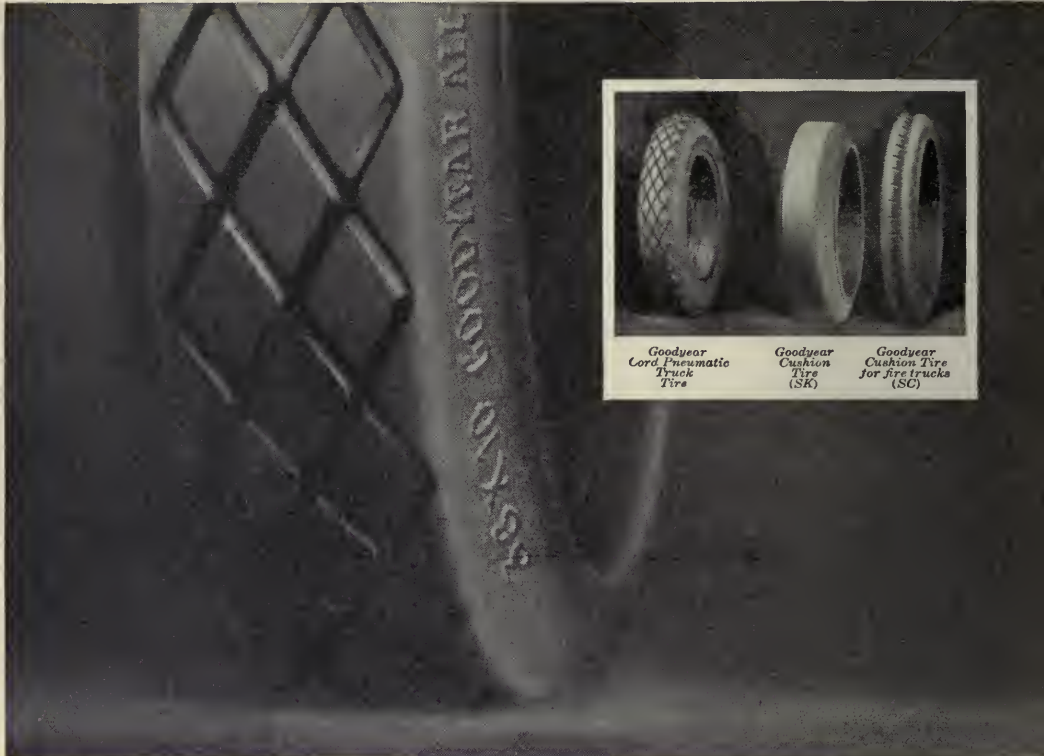
County Engineer. This is a black line about 3 inches wide running along the center of the pavement the entire length. The purpose is to direct traffic to the right side going in both directions. It is hoped that this will prevent accidents caused by cars staying too close to the center.

The members of the Chamber of Commerce who worked incessantly for months in pushing the election which made possible the issuing of bonds for paving Woodbury County's road will feel well repaid for their work as they travel over the Merville road. No more mud, no more hard hills to climb; instead, there is a smooth, year-round, hard-surface road.

It was about three years ago that the question of how to get good roads was uppermost in the minds of the people in Sioux City and Woodbury County. The Sioux City Chamber of Commerce early took an active part and determined to carry through a road-building program. A strong committee worked incessantly against heavy opposition to secure the proposed law which made possible the voting of bonds for the hard-surface roads. It was at this stage that the Chamber of Commerce, together with other civic organizations in Sioux City, performed one of the biggest stunts ever attempted in the state. They moved the State Legislature to Sioux City. This body of lawmakers came to the city, viewed with enthusiasm the paved highways within the city limits, went back to Des Moines and passed the new law. They had not realized before what concrete roads meant to a community.

Next, the Chamber of Commerce took the

GOODYEAR



Goodyear All-Weather Tread Solid Tire

Copyright 1922, by The Goodyear Tire & Rubber

Goodyear All-Weather Tread Solid Tires show remarkable tractive and cushioning qualities in service on heavy duty trucks.

Their All-Weather Tread design furnishes in the 36 x 10 size, for example, 704 inches of sharp gripping edges so that in the heaviest going this tire grips hard and holds to the road.

The height and tread design of the Goodyear All-Weather Tread Tire make it much

more resilient than a smooth surface tire and even springier than many so-called cushions. This lasting resilience protects both the engine and the chassis from road shocks and jars.

Much thicker than the ordinary smooth tread solid tire, they wear much longer.

For lighter and quicker hauling, Goodyear makes other special tires—Goodyear Cord Truck Tires and Goodyear Cushion Tire



Single Jacket Underwriters Fire Hose

The Underwriters label on Goodyear Single Jacket Fire Hose and Goodyear Monterey Chemical Hose, means that the latter will resist satisfactorily the biting, corrosive action of chemicals and that both will stand a definite pressure per square inch. Goodyear's years of manufacturing experience has enabled the production of hose on a par with all other Goodyear products—hose which will render dependable and economical service.



Monterey Chemical Hose

lead in putting through a \$2,500,000 bond issue for the actual hard-surfacing of a county primary road system. This issue, with assessed benefits, will provide more than \$3,500,000, to be spent as rapidly as conditions permit. The campaign included liberal use of printer's ink and wide-spread information on the proposed bond issue, which was carried by a large majority.

The entire cost of the road was \$51,000 per mile, including grading and finishing. The contract price for the concrete was \$3.67 per square yard and \$1.12½ per cubic yard for subgrade work.

JOHN D. ADAMS,
Industrial Commissioner, Sioux City Chamber of Commerce.

Business Aspects of a College

POUGHKEEPSIE, N. Y.—The Poughkeepsie Chamber of Commerce is now lending its efforts toward securing the Vassar College \$3,000,000 Salary Endowment Fund. The Chamber has undertaken to raise the sum of \$30,000 from the business and professional interests of the city as its contribution to the fund.

A unique folder has been prepared and mailed to all the prospective subscribers, in which the advantages of the College to the community are clearly set forth. The pamphlet is entitled "Do We Appreciate It?" and the College is compared to an industry already located or seeking to locate within the city.

It is set forth that the College buildings have a total valuation of \$3,305,000; that the annual salaries and wages paid faculty and employes of the College amount to \$650,000; that the spending power of the student body (conservatively estimated at \$50 per student) exceeds \$60,000, and that the cost of supplies purchased by the College in the city of Poughkeepsie equals at least \$150,000 per year. It is therefore estimated that approximately \$900,000 is annually turned from the College into the various channels of trade of the city.

The prospective subscribers are then asked the following questions:

"What would I give to bring an institution to the city of Poughkeepsie which would spend \$900,000 per annum if the same were not already located here?"

"What would I give to keep Vassar College in the city of Poughkeepsie if there were any intention of its moving to some other locality?"

The response to the appeal of the Chamber of Commerce has been very gratifying. Contributions are coming unsolicited to the Chamber offices, and the officers and directors of the organization are confident that the \$30,000 requested by the Chamber will be forthcoming. The people of the city in general appreciate the presence of the College, and to date 99.2 per cent of the Poughkeepsie alumni have subscribed to the fund.

R. W. BUDD,
Secretary, Poughkeepsie Chamber of Commerce.



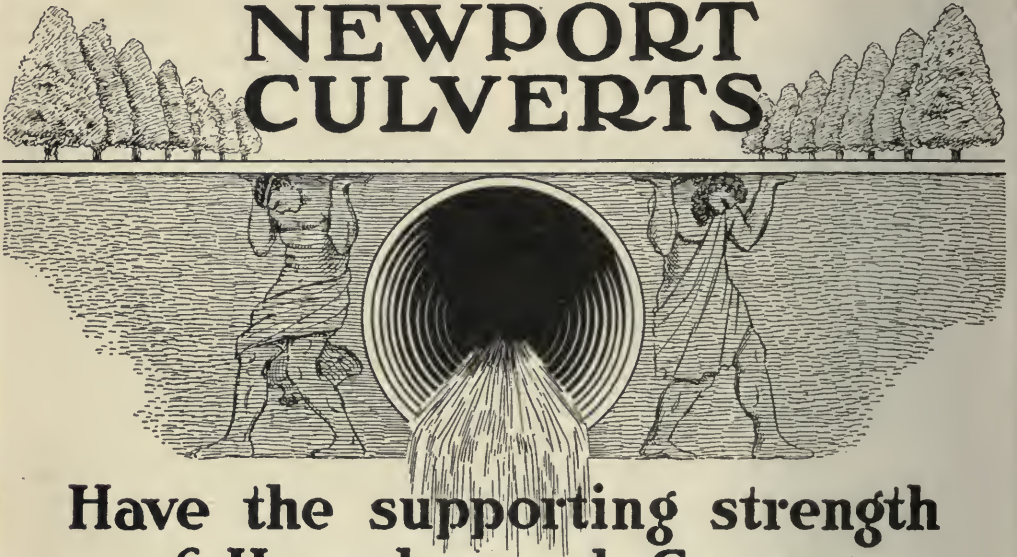
SUCH A SIGN-BOARD IS USEFUL, APPROPRIATE AND BEAUTIFUL

The Doorway to Portsmouth

PORTSMOUTH, N. H.—The photograph above shows one of the new signboards, of which a dozen or fifteen will be erected in this city in the near future. They are the gift of one of the Directors of the Chamber of Commerce. No more appropriate type of guide-board could have been designed, for it is copied from one of the fine old colonial doorways for which the city is famous. The doorway is also a symbol of hospitality. Thus Portsmouth, in addition to erecting sign-boards which are at once artistic, appropriate and distinctive, has chosen a symbol which thousands of tourists, who pass through daily in summer, will recognize as a welcome sign.

H. F. SHERWOOD,
Managing Secretary, Portsmouth Chamber of Commerce.

NEWPORT CULVERTS



Have the supporting strength of Hercules and Samson

Mythology and Biblical history record the great supporting strength of these ancient heroes. The records of many cities, counties and states tell of the great supporting strength of Newport Culverts. The remarkable lasting qualities of these corrugated metal culverts is due to the ability of the metal to withstand corrosion.

Newport Culverts are made of genuine open hearth iron (99.875 per cent pure iron copper alloy), which lasts a lifetime.

Newport Culverts are made in full-round and half-round shapes to make them fit all conditions. Full-round shapes are most serviceable where there is a deep fill and plenty of head room. In those places where there is little fill, the half-round culvert with flat bottom makes the best proposition because of its small height.

Full descriptive illustrated literature sent free on request.

NEWPORT CULVERT CO., INC.

542 West 10th St.

Newport, Kentucky

**Wyandotte Adver-
tises Its Pure Water**

WYANDOTTE, MICH.—The Wyandotte Board of Commerce, in cooperation with Donald M. Hatch, Superintendent of the Water Department of that city, has adopted a novel plan of welcoming the visitors to the municipality and at the same time incorporating some excellent advertising for the city. The large sign-board which is illustrated herewith not only shows a view of the new and up-to-date filtration plant recently installed in the city, but also illustrates in a practical way the purity of its water-supply by a bubbling drinking fountain extending out from the face of the sign. There are three of these billboards located at the various entrances to the city, and, as will be seen by the illustration, other advantages of the city are set forth in a panel at the left of the view of the filter plant.



AN ATTRACTIVE SIGN ERECTED BY THE WYANDOTTE BOARD OF COMMERCE

JAMES H. PINSON,
Secretary-Manager, Wyandotte Board of Commerce.

A City Plan for Spartanburg

SPARTANBURG, S. C.—Work on a comprehensive plan for the city of Spartanburg has begun. The contract with Dr. John Nolen, of Cambridge, Mass., was signed October 3, the city, the Park Commission and the Chamber of Commerce each agreeing to bear one-third of the expense.

At a meeting of the Members' Forum of the Chamber of Commerce, held February 23, 1920, Professor B. O. Hutchinson, of the Faculty of Converse College, offered a resolution recommending that the Board of Directors of the Chamber of Commerce take steps to secure a city plan. This resolution was adopted by the Board, and a committee on city planning was appointed.

For the past year and a half the committee named by the Directors of the Chamber of Commerce has been busy working toward the objective proposed in the resolution. Dr. Guy E. Snavely, the chairman, was sent to Cincinnati to attend the Conference on City Planning. He returned

more enthusiastic than ever over the project. Carl F. Pilat and John Nolen came to Spartanburg by invitation and delivered addresses before large numbers of citizens assembled at Forum meetings at the Chamber of Commerce.

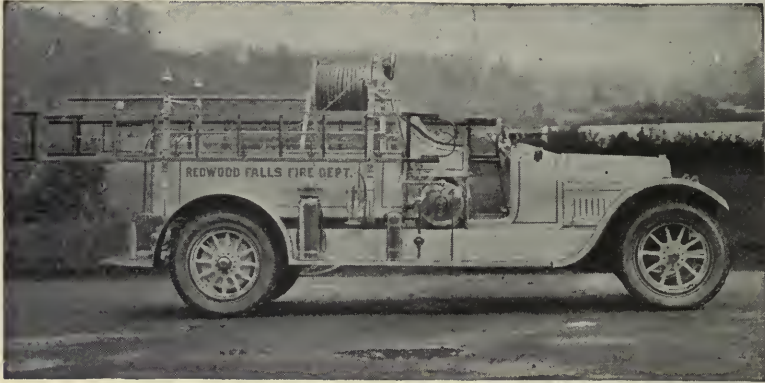
When the South Carolina Legislature gave the Spartanburg Park Commission city planning authority, the Chamber of Commerce passed a resolution guaranteeing one-third of the cost of a city plan, provided the other two-thirds were carried by the city and the Park Commission.

Before the contract for the city plan was signed, the Park Commission was developing Cleveland Park, in the northern part of the city. This park, which is half completed, will have a lake covering three acres, tennis grounds, a baseball diamond, a club house and picnic grounds. For this work the city voted \$50,000 in bonds, and John B. Cleveland, a prominent citizen, donated a large tract of land for the park.

For several years the Chamber of Commerce and many business interests have felt the need of an industrial survey of the city. It now transpires that the work undertaken will in a large measure include an industrial survey in connection with the city plan. This information will be of immense benefit to the Chamber of Commerce.

D. G. SPENCER,
Publicity Secretary, Spartanburg Chamber of Commerce.

Northern Fire Apparatus



Northern Equipped, Cadillac "8" Chassis. In Service in Redwood Falls, Minn.

Our Liberal Selling Policy

—boosts local business of your city. You pick your favorite chassis, and go to your own truck dealer to get a price quoted on it, Northern Equipped. Your dealer gives the matter personal attention. His shop becomes your service station when the job is delivered.

The Northern Is Guaranteed

Under our sales plan you have not only the personal attention of a dealer you know, but also the liberal guarantee and international reputation of Northern Fire Apparatus behind the job.

Sales Offices: Every Truck Dealer, Everywhere

"We furnish everything but the chassis"

Northern Fire Apparatus Co.

2420 University Ave., S. E.

Minneapolis, Minn

Lockport Board Promotes Office Building

LOCKPORT, N. Y.—A little more than a year ago at one of the membership get-togethers of the Board of Commerce, on the matter of erecting a building to cover the site occupied at that time by ruins left because of the broadening and deepening of the State Barge Canal, it was suggested that it might be a splendid piece of work for the Board of Commerce to endeavor to cover this site with a modern store and office building to be the home of the Board of Commerce. This

appealed greatly to the membership, because of the fact that these ruins occupied one of the most conspicuous and prominent places on our Main Street, and a committee was immediately appointed to investigate the possibilities and to report. As a result of the report of the committee an organization was incorporated and a campaign launched for the selling of stock, which has resulted in the directors of the corporation proceeding to build, and the building is now under construction.

The building is to be a two-story structure with six storerooms on the main floor and offices on the second, and is to be known as the Board of Commerce Building. The novel feature of the building is that the basement is to be utilized also as storerooms. Because of the fact that it overlooks the locks of the State Barge Canal, the stairway and sidewalk are being run from



WHERE WAS FORMERLY A LOCAL EYESORE THE LOCKPORT, N. Y., BOARD HAS BUILT ITSELF AN ATTRACTIVE HOME

the street completely around the back of the building, forming a terrace overlooking the canal. The fact that there is a street on the opposite side of the canal gives wonderful promise to these basement storerooms, and virtually affords us a three-story structure. Construction is to be of reinforced cement, stone, and brick, and will be a tremendous improvement to our Main Street. The building when completed will cost approximately \$80,000, the greater part of which has been subscribed by local citizens, who have responded to the appeal of civic pride.

This project has met with such great success, and the directors of the corporation are so much encouraged, that they are now beginning to look around to see what they can next undertake in the way of civic development and improvement.

D. HODSON LEWIS,
Secretary, Board of Commerce.

On the Calendar of Conventions

JANUARY 17-20.—CHICAGO, ILL.
American Road Builders' Association. Annual convention. Secretary, E. L. Powers, Editor *Good Roads*, 11 Waverly Place, New York, N. Y.

JANUARY 18-20.—NEW YORK, N. Y.
American Society of Civil Engineers. Annual meeting. Secretary, Charles Warren Hunt, 33 West 39th Street, New York, N. Y.

JANUARY 30.—TRENTON, N. J.
New Jersey State League of Municipalities. Annual meeting. Secretary, Clinton J. Swartz, 712 American Mechanic Bldg., Trenton, N. J.

FEBRUARY 16-18.—ALTOONA, PA.
Pennsylvania Commercial Secretaries Association. Semi-annual convention. Secretary-Treasurer, B. W. Grills, Secretary, Chamber of Commerce, McKeesport, Pa.

MAY 15-19.—PHILADELPHIA, PA.
American Water Works Association. Annual convention. Secretary, J. M. Diven, 153 West 71st Street, New York, N. Y.

MAY 9-11.—ATLANTIC CITY, N. J.
National Fire Protection Association. Annual meeting. Secretary, Franklin H. Wentworth, 87 Milk Street, Boston, Mass.



State Trunk Line No. 13 in Kilbourn, Wisconsin. Maintained with annual treatments of "Tarvia-B" since 1916



Good Roads that Grow Better—

MOST people are satisfied when the roads stay "as good as new." But not so the Road and Bridge Committee of Columbia County, Wisconsin.

They build good roads to start with and then, by far-sighted but inexpensive maintenance with "Tarvia-B," make those good roads better every year.

This extract from their letter will be of interest to all highway officials:

"Our experience in successfully maintaining our macadam roads with "Tarvia-B" is due not only to the excellence of your product, but also the rule we follow in Columbia County of surface treating macadam roads in good condition and giving them additional treatments of Tarvia annually.

"During the past couple of years, we have used clean limestone screenings $\frac{3}{4}$ "

size as a covering after applying the Tarvia. We believe we are adding just a little more Tarvia surface each year than the traffic wears off, as we have several macadam roads in this county that have been annually treated with "Tarvia-B" for the past six years and are in better condition at the present time than they were when first treated with Tarvia."

The use of Tarvia re-enforces the road surface and makes it waterproof, frost-proof, mudless, dustless and automobile-proof. A road maintained with Tarvia pays for itself over and over again.

Tarvia is a coal tar preparation, made in a number of grades to meet construction, maintenance and repair problems.

Illustrated booklet describing the various Tarvia treatments free on request.

Tarvia

*For Road Construction
Repair and Maintenance*

GOOD ROADS SHOW

Visit our booth at the Coliseum, Chicago, Ill., during the Good Roads Show of the A. R. B. A.,

January 16-20, 1922.

The *Barrett* Company

New York	Chicago	Philadelphia	Boston	St. Louis	Cleveland	Cincinnati	Pittsburgh
Detroit	New Orleans	Birmingham	Kansas City	Minneapolis	Dallas	Nashville	Syracuse
Salt Lake City	Seattle	Peoria	Atlanta	Duluth	Milwaukee	Bangor	Washington
Johnstown	Johnson	Youngstown	Tulsa	Columbus	Richmond	Lafayette	Belleville
Elizabeth	Buffalo	Baltimore	Omaha	Jacksonville	Houston	Dayton	
THE BARRETT COMPANY, Limited.		(Montreal)	(Toronto)	(Winnipeg)	(Vancouver)	St. John, N. B.	Halifax, N. S.

The Selection of Superheaters for Municipal Power-Plants*

By W. F. Schaphorst, M. E.

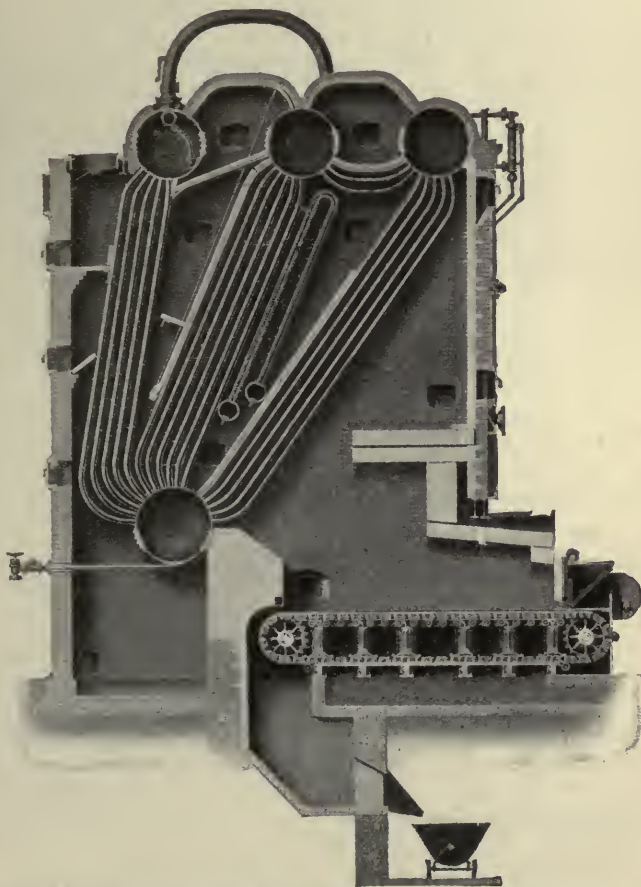
THE natural temperature of steam at atmospheric pressure is 212° F. Pass this steam through a superheater and increase its temperature to 312° F., without increasing its pressure, and you have steam of 100° superheat. Similarly, the natural temperature of steam at 200 pounds absolute pressure is 381.9° F. Pass this steam through a superheater and increase its temperature to 481.9°, without increasing its pressure, and you have steam of 100° superheat. The function of the superheater, therefore, is simply to increase steam temperature—not to increase pressure.

Reference has been made in previous articles of this series to the advantages of superheated steam. In all large modern steam power-plants superheated steam is invariably specified. With superheated steam, higher efficiencies and economies are obtainable because efficiency is dependent upon "temperature difference" in the same way that the efficiency and power of a hydraulic turbine are dependent upon the difference in water level.

Not only does superheated steam increase the efficiency of engines and turbines, but the efficiency of boilers equipped with superheaters is slightly increased. In European countries it is common practice to guarantee an increase in boiler efficiency of from 1 to 1½ per cent, although such a slight increase would be difficult to prove.

Superheaters are usually placed somewhere within the boiler setting, integral

with the boiler, in order that the hot flue gases may do the superheating. The superheater is never placed directly in the furnace of the boiler itself, because in that location it could not withstand the heat; in all probability it would melt. Nor is the superheater placed at the "exit" of the gases, because at that point the gases are comparatively cool—so cool that they would not superheat the steam to a sufficiently high temperature. Consequently, it is common practice to-day to divide the boiler into "decks," placing the superheater between



RECLASSIFIED STIRLING BOILER WITH BABCOCK AND WILCOX STEAM SUPERHEATER AND BLAST TYPE CHAIN GRATE STOKER

* Copyright, 1921, by W. F. Schaphorst.

THE AMERICAN CITY

“PENNSYLVANIA TRIO”

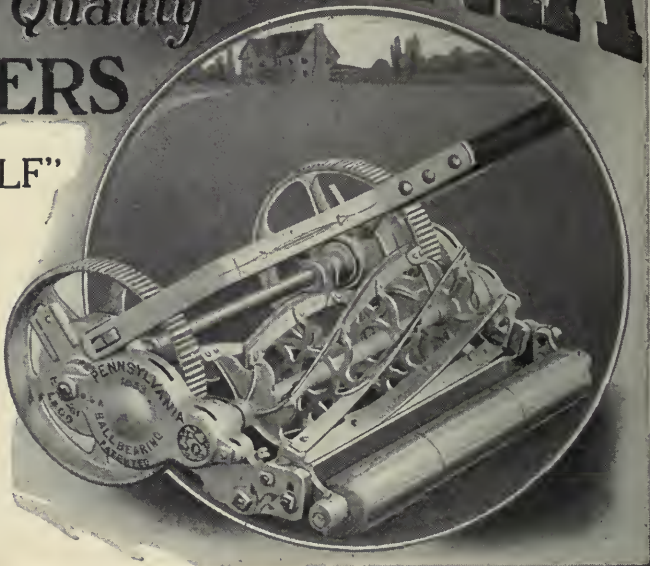


THE “PENNSYLVANIA TRIO” is the triumph of the famous Pennsylvania *Quality* Line. It embodies all the exclusive quality features. No other mower will cut grass on golf courses, big estates or parks as efficiently, economically or speedily.

PENNSYLVANIA

Quality

LAWN MOWERS



“PENNSYLVANIA GOLF”

The “Pennsylvania Golf” has no rival when close cutting is required on tennis courts, putting-greens and lawns. It trims to $\frac{3}{16}$ of an inch. All its blades are crucible tool steel; self-sharpening.

Write for “Pennsylvania Book”

PENNSYLVANIA LAWN MOWER WORKS, Inc.
1615 North 23rd Street, Philadelphia, Pa.

the decks at a point where the temperature of the gases for heating the superheater will be suitable.

The selection of the right kind of superheater depends largely upon the load conditions in the plant. If the load is comparatively steady, a superheater of the above type would do very well, but if the load fluctuates violently, being below normal at one time and 100 to 200 per cent above normal at another time, it is evident that the superheater would also fluctuate considerably and a different type of superheater should be selected. Superheated steam of a constant temperature is always most desirable.

There is on the market a type of superheater equipped with an automatic temperature control that by-passes the hot flue gases in such a way that fairly constant superheat is maintained. At the same time, if the boiler is equipped with an economizer, the heat in the hot gases is not wasted. If the boiler is not equipped with an economizer, it is better to waste the flue gases than to melt or burn the superheater with the excessively high temperature gases.

The above types of superheaters are made integral with the boiler. Where load conditions vary suddenly, or widely, or where the prime movers are located at a considerable distance from the boilers, a "separately fired superheater" located on the main steam line may be the correct solution. To be sure, separately fired superheaters are less efficient than the integral type and are not so much used. The integral type is always preferable wherever it can be installed. Superheaters that are separately fired should be automatically regulated or carefully watched so that in case of a sudden drop in steam consumption the superheat will not run too high and the superheater will not be ruined.

Necessary Cautions

It must be remembered that, although beneficial as regards steam consumption, superheated steam also has its upper limitations. If allowed to get too hot, superheated steam will ruin brass and other alloy fittings and may have a retarding effect upon the lubrication of steam engines. Turbines, engines, and fittings are usually made of different kinds of metals, joined together. Each metal usually has a coefficient of expansion of its own, different from those of

the other metals, and thereon, also, hinges another trouble.

In selecting a superheater, bear in mind the fact that placing it within the boiler setting is liable to increase the frictional resistance of the gases through the boiler. Be sure that this resistance is not increased too much. The superheater should be so placed that it will have ample space in which to expand and contract, independently from the boiler, boiler parts, and setting. See that the superheater is equipped with an independent safety-valve of the outside-spring type. This safety-valve should be set slightly lower than the safety-valve on the boiler, so that in case of too high pressure the superheater valve will let go first and there will always be a flow of steam through the superheater. Otherwise, if the boiler safety-valve lifted first, the flow of steam through the superheater might cease and the superheater might be ruined by burning. Also be sure that the superheater is equipped with drains for removing water from all portions before starting up. Unless the superheater is thoroughly drained, slugs of water may be carried along with the steam to the prime movers, with results that might prove disastrous.

Users of superheaters should be careful about permitting saturated steam connections to the boiler in addition to the superheater connection, especially to the prime movers. This is bad practice, because the use of saturated steam reduces the amount of superheated steam, the velocity of superheated steam is reduced correspondingly, and as a result there might not be sufficient flow through the superheater for its own protection against distortion or burning. Saturated steam connections should never be permitted to carry more than 10 to 15 per cent of the entire amount of steam generated by the boiler.

Despite the great amount of study that has been given superheaters and despite the broad experience that has been had with them, it is practically impossible to predict with accuracy the performance of a superheater under varying conditions. With a given coal, a mechanical stoker may give a lower degree of superheat than would hand-firing with the same coal. It is reported that in one plant, which was converted to burning oil from previous mechanical stoking, the superheat was reduced 36 per cent

RESOLVED That because of the need
of safety and economy in
street traffic control

MUSHROOM TRAFFIC LIGHTS
(Milwaukee Type)

Should be installed at street crossings, on narrow streets, heavy traffic streets and boulevards. This steel unit is readily visible by day and night as it is located where the driver is looking and when illuminated is a bright spot without glare. It stands only eight inches high but it is large enough to readily control the most habitual "corner cutter." It is accident-proof, indestructible and equipped with a duplex lighting system that insures constant service. See exhibit at the Good Roads Show, Chicago, Jan. 16-20, 1922.

Our Descriptive Bulletin sent free on request.

Electrical & Specialty Supply Company
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at normal load; reduced 40 per cent at 50 per cent overload; and reduced 42 per cent at 100 and 150 per cent overloads respectively. It is evident, therefore, that the fuel and method of firing have much to do with the degree of superheat obtainable. Other factors that affect the degree of superheat are: amount of excess air used in combustion; heating value of coal burned, as well as kind of coal; type of stoker used; and quality of manual attendance.

In view of these facts, therefore, the

municipal power-plant official must not be surprised if, after purchasing and installing a superheater, it fails to give the exact degree of superheat desired—unless it is of the type equipped with by-passes and automatic temperature control. The writer knows that some of the largest manufacturers of superheaters are still having their troubles. In spite of these troubles, however, superheaters are to be recommended as important economy factors in all modern municipal steam power-plants.

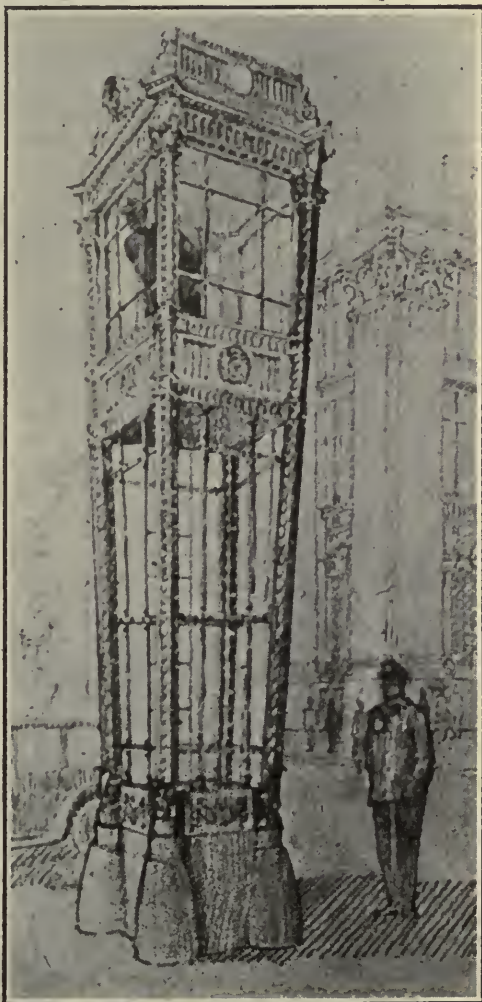
New York's Traffic Towers

MUNICIPAL officials throughout the country, especially those directly interested in traffic control, are familiar with the story of New York's traffic towers. The five now in use were installed along Fifth Avenue by Dr. John A. Harris, Special Deputy Police Commissioner, at his own expense, and were originally in the nature of an experiment. They have worked out so satisfactorily that their permanent retention has been decided on.

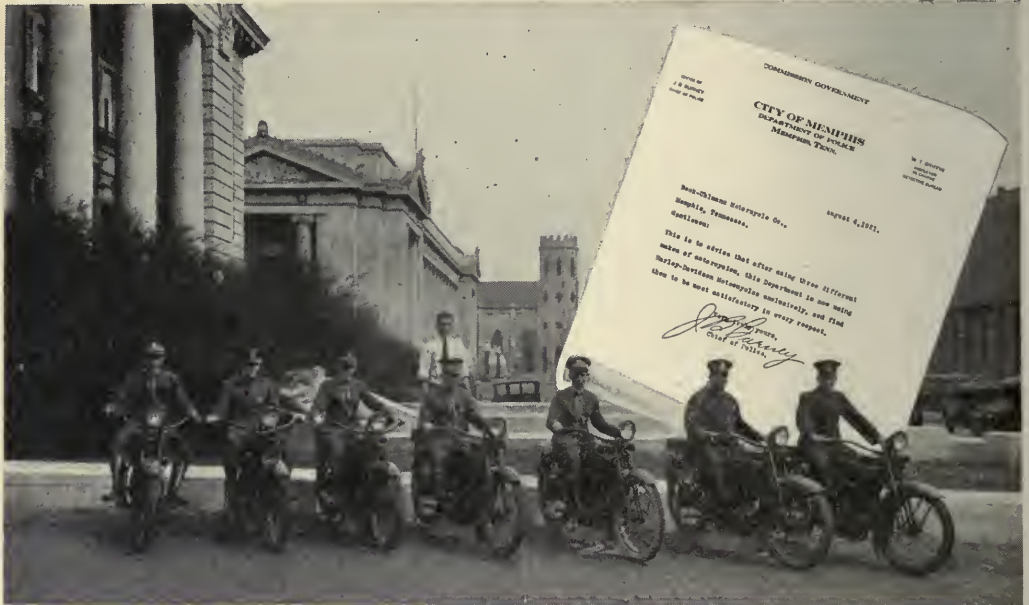
The Fifth Avenue Association offered a prize for the design of a bronze traffic tower, more ornamental than the simple, temporary structures originally erected. The prize was won by Joseph H. Freedlander, who will be retained as architect to supervise the construction of the new towers. The contest aroused much interest among architects throughout the country. The Association's announcement says:

"The new signal towers are to be constructed almost entirely of bronze, with a granite base 4 feet square and 3 feet high. They will be 23 feet in height. The base is to have granite 'striking blocks' at each corner to fend off traffic and to protect the tower itself. The lower part of the structure will be open so as to allow an unobstructed view up and down the avenue. The space at the top which is to house the traffic policemen will be enclosed in glass windows, so operated as to allow the policeman in the tower to open or close all of them at one time with a single swing of a lever. The towers will be heated by means of electric stove."

Besides the \$500 first prize, second and third prizes of \$300 and \$200 were offered. Dr. John H. Finley, former Commissioner of Education of the State of New York, made the address at the banquet at which the prizes were awarded.



THE WINNING DESIGN FOR NEW YORK'S TRAFFIC TOWERS



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Harley-Davidson

World's Champion Motorcycle

Municipal Finance

BONDING

ACCOUNTING

TAXATION

Own Your Own City

Two Canadian Cities Try an Interesting Experiment in Finance

THE city of Brantford, Ontario, Canada, recently completed the marketing of \$550,000 city bonds "over the counter." The treasurer, Arthur K. Bunnell, believed that, after its experience with the war loans, the public was prepared for such an experiment, provided the proper atmosphere was created. He therefore called into consultation all the bond brokers doing business in the city, and with them arranged a joint newspaper advertising campaign, calling attention to the soundness of the investment, the satisfactory rate of interest, 6 per cent, and to the fact that it was a matter of good citizenship to provide funds for the needs of the municipality. The brokers were allowed a commission of one-half of 1 per cent on their sales.

The bonds were issued in denominations of \$100 and up, with interest payable half-yearly. The population of the city is only a little over 33,000, but the bonds were readily absorbed. The distribution was very broad, embracing all classes of the community, and as a natural consequence has considerably stimulated civic interest. The experiment was a complete success, and it is believed that the future requirements of the city for any reasonable amounts can be cared for by the local investing public.

A similar experiment, reported by Leslie Andrew, City Commissioner, was tried in the city of Saskatoon, Saskatchewan, recently, when debentures of the city to the amount of \$100,000 were sold to the citizens over the counter.

Saskatoon has an estimated population of 30,000. It is the distributing point for a vast farming district, being situated on three lines of railway, each of which has a number of branches radiating into the surrounding territory. The district this year had one of the best crops in its history and

is therefore enjoying a liberal measure of prosperity.

Finding it necessary to raise \$100,000 by the sale of debentures, and realizing that the time was inopportune to approach the money market in the usual way, the City Council, on the recommendation of the Commissioner, decided to offer the debentures locally through the City Treasurer's office. Publicity was given to the Council's decision, and immediately there was a brisk demand for the bonds, with the result that they were quickly disposed of.

The bonds were sold at a price to yield the investors 7 per cent interest. They were of the sinking fund variety, \$76,000 being issued for a term of 5 years and the balance of \$24,000 running for 10 years. The denominations issued were \$100, \$500, and \$1,000. It was found after the issue had been fully taken up that \$67,000 had been subscribed for in denominations of \$1,000, \$20,000 in \$500, and the balance in \$100 denominations.

The bonds were not printed until the sale had been completed, thus giving purchasers the greatest possible latitude in the amount they desired to purchase. As subscriptions came in, the City Treasurer issued interim certificates, these being turned in again when the definitive bonds were ready for delivery to the purchasers.

Part of the success which attended the floating of the local debenture issue in Saskatoon must be attributed to the education of the people as to the value of bonds from a savings investment standpoint through the various loans floated in recent years by the Dominion Government to defray war expenses. It must not be overlooked that an attractive rate of interest was offered to the investors, which, apart from any question of patriotism, was a considerable factor in the success of the issue.

Indian Scout

The Universal Motorcycle



Here's a messenger boy
16 years old.

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an

Indian Scout

because it was not heavy,
it was not noisy, it was
clean, mechanically simple,
easy to handle and
economical to operate. She
knew her son could use
a Scout profitably and
without danger.

Here's a Motor Cop.
The city bought him
an
Indian Scout

because in addition to
recognizing the essential
features which influenced
the mother's purchase they
realized that the Scout was
strong, reliable and suffi-
ciently speedy and power-
ful to answer every require-
ment of their mounted
policemen.



LIGHT ENOUGH FOR THE MESSENGER BOY **That's Why**
STRONG ENOUGH FOR THE MOTOR COP

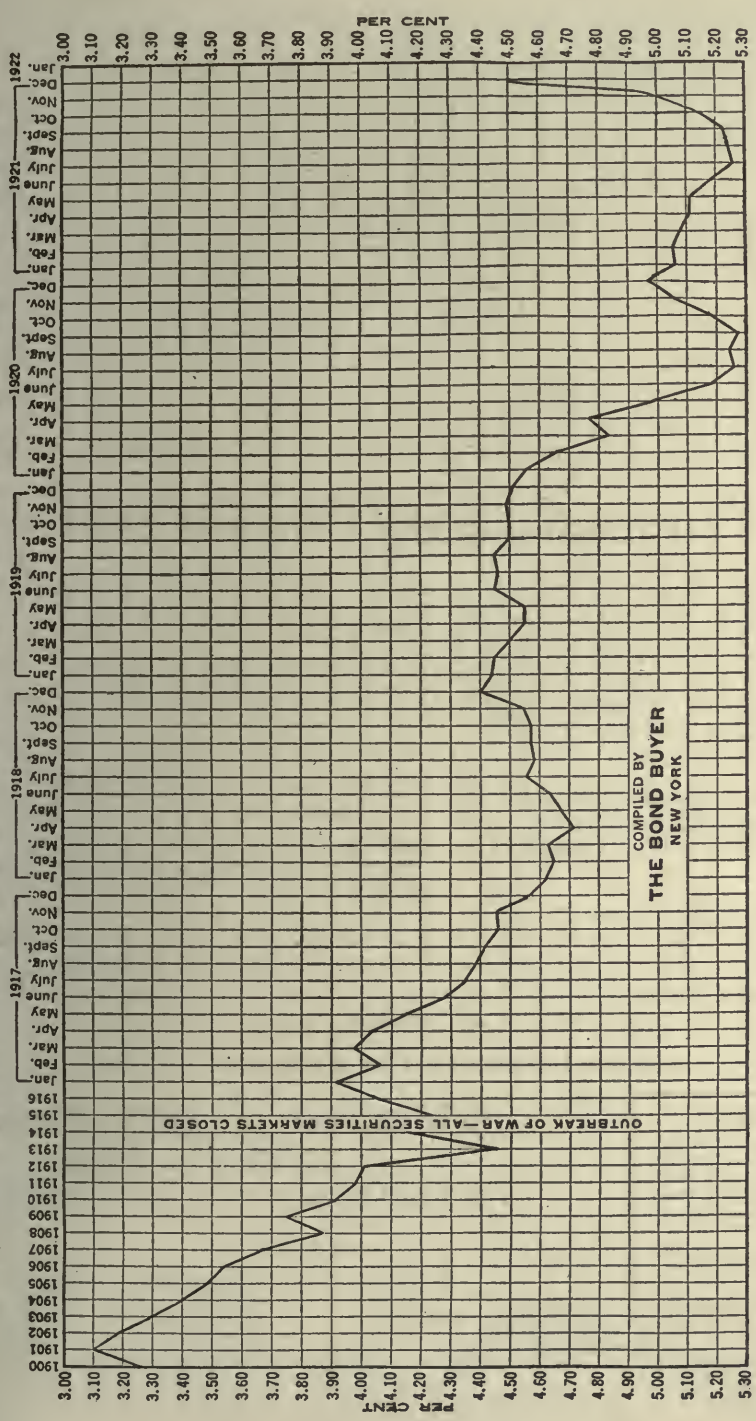
The Indian Scout is the Most Popular Motorcycle in the World

Largest Motorcycle Man-
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HENDEE MANUFACTURING CO.

Municipal Dept.
Springfield, Mass.

(Curve represents the average market value, expressed in net income basis, of bonds of twenty large cities in the United States.)



COMPILED BY
THE BOND BUYER
NEW YORK

Twenty-One Years of Municipal Bond Values

This graphic history of the trend of the municipal bond market is of great value to every municipality considering the issuance of bonds in the near future. As THE AMERICAN CITY goes to press, the figures for December, 1921, are not available; it may be safely predicted that they will carry the graphic line higher. It will be noted that the municipal bond market is well advanced on the road to "normalcy." See page 77 for analysis.



At Last! A Successful Snow Plow For The Fordson

The Wehr Company introduce the Wehr Highway and Street snow plow for the Fordson Tractor, after exhaustive tests and experiments. It is a proven and effective snow plow, which opens new sales possibilities for every Fordson dealer in the Northern States.

It affords the county the cheapest and most economical equipment for keeping the highway open, even during the severest blizzard.

It is the only Snow Plow on the market on which the side-draft can be controlled by the tractor, as the tractor pivots over a heavy push bar, so a straight line of draft on the tractor can be maintained at all

times. The draft is taken from the tractor draw bar.

It is the only Snow Plow which will take a cut with half of the blade, and maintain a straight course. This is important when cutting through drifts.

The Fordson Tractor can handle this Snow Plow on high speed over ordinary grades encountered on cement highways or City streets, maintaining a speed of eight to ten miles per hour.

The Wehr Snow Plow will handle icy conditions, keeping gutters clean and ruts out of roads, making a smooth road for automobile travel.

Liberal Discount to Dealers.

SPECIFICATIONS —
The Wehr Snow Plow has a ten foot blade, set at an angle of forty-five degrees, cutting eight feet. The blade can be raised or lowered at either end. It is equipped with worm-gear Steering Control.
Weight two thousand pounds (2000) —weight of plow is carried on four runners.
Plow can be equipped with auxiliary wheels, which can be lowered when going over bare spots.
The Snow Plow is attached to tractor with one bolt.

Wehr Company
549 Thirtieth Street
MILWAUKEE WISCONSIN



Municipal Bond News

THE graph of the municipal bond market compiled by *The Bond Buyer* and shown on page 75 is of great interest to followers of the municipal bond market. It illustrates clearly the major movements of the municipal bond market, in terms of yield, rather than in terms of price, which form the basis of most graphic charts. For this reason it will appear at first glance to be inverted.

The Effects of the War

First of all, it shows how difficult it would be to determine an exact "normal" rate for municipal bonds. In the years between 1901 and 1913 we find the cost of money to municipalities steadily rising, over a total fluctuation of 1.30 per cent. Then came a partial recovery, which culminated with the approach of our entrance into the war. With the actual declaration, the cost of money began a rising movement lasting about a year, when rates became stabilized in the 4.40 to 4.70 zone. This may be explained by reference to the direct influence of the Government on money rates, necessitated by the flotation of the Liberty and Victory issues. The value of the tax exemption features of municipals is also emphasized in this period, as it saved the bonds of municipalities from the full force of competition with the more speculative industrial securities, which during this period yielded very much higher returns, subject, of course, in the case of large investors, to very high taxes.

The Period of Deflation

With the month of November, 1919, begins another pronounced curve. This may be said to have terminated in July of 1921, and is the history of "deflation" expressed in terms of municipal bonds. It was a period of "tight money," during which large quantities of high-coupon bonds of industries, as well as of foreign governments, were offered to investors. Without going into a discussion of the economic merits or demerits of tax exemption of municipal securities, it may be safely stated that the tax exemption feature held down the rate on municipal securities rather effectively. The graph shows that the average net income of bonds of twenty large cities of the United

States did not quite reach the 5.30 per cent level, while at the same time a yield of 7 and 8 per cent was common in taxable corporate and foreign securities of very high investment rating, and a return of above 5.30 could be found in certain issues of the Federal Government itself.

The Recovery of the Bond Market

The municipal bond market began to give convincing evidence of its strength with the short-lived recovery commencing in September, 1920, checked after a few weeks and gradually forced down. Possibly this was due to the very heavy offerings of municipal bonds which have marked the year 1921. The table which appeared on page 431 of the November *AMERICAN CITY* showed the record-breaking volume of these issues.

In July, 1921, began another recovery, gradual at first, but gaining momentum, until in the single month of November the averages rose one-half of one per cent, in a perpendicular movement such as the market had not seen in this generation. At present this movement still continues with great vigor. The first of December saw the averages established in what may be called the "war zone," and probably the first of January found the average at nearly pre-war levels.

Bond Issues of the Month

Among the municipal bond offerings of December which have aroused especial interest may be mentioned the issues of Rochester, Buffalo, and New York. The Rochester bonds were brought out early in the month on a $4\frac{1}{2}$ per cent basis, and the offering is regarded as one of the most successful of the year. The Buffalo and New York bonds appeared the following week. The Buffalo issue totaled \$7,360,000, of which \$6,000,000 were school bonds. The bonds mature in from one to twenty years, carry a $4\frac{1}{2}$ per cent coupon, and have found a ready market at prices to yield 4.20 to 4.05, according to the date of maturity.

The same day New York brought out \$55,000,000 of corporate stock. This, too, bears a $4\frac{1}{2}$ per cent coupon, runs 50 years, and has been sold on a $4\frac{1}{4}$ per cent basis. For these bonds the syndicate bid 103.407, and the issue is currently traded in, on a when-issued basis, at about 104 $\frac{1}{2}$. It is stated that one must go back to 1909 to find an issue placed on better terms, as far as New York is concerned.



Cletrac Keeps The Roads Open

THE picture shows the crawler type Cletrac fighting the deep snow on the Schenectady-Albany turnpike last winter. On a four mile stretch of this road the drifts were so high in places that the Cletrac often had to cut back and forth three or four times, but it stayed right with it and opened the road for traffic in three hours time.

Municipalities in all parts of the country keep Cletracs on hand to insure themselves against traffic tie-ups in winter. New York City alone has 100 for this purpose. And in the summer of course, they are used for street cleaning and maintenance and all kinds of heavy haulage jobs.

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The City's Legal Rights and Duties

Information for City Attorneys and Other Municipal Officers, Summarizing
Important Court Decisions and Legislation

Conducted by A. L. H. Street, Attorney at Law

City May Regulate But Not Prohibit Hospitals for Contagious Diseases

An ordinance prohibiting maintenance anywhere in the city of any hospital for treatment of contagious or infectious diseases, is wholly unreasonable, and so not justified as an exercise of the police power. And enforcement of such an ordinance will be enjoined. These two propositions were decided by the California Supreme Court in the case of *San Diego Tuberculosis Association v. City of East San Diego*, 200 Pacific Reporter, 393.

Plaintiff successfully sued to enjoin enforcement of an ordinance of defendant city, which declared every hospital for the treatment of persons afflicted with contagious or infectious diseases to be a nuisance, making the maintenance of any such hospital within the limits of the city a misdemeanor, and making its maintenance a separate offense for each day. A series of prosecutions was commenced against plaintiff's officers and employees and its continuation was threatened. Upholding plaintiff's right to an injunction, the Supreme Court says:

"Two questions are presented: first, is the ordinance invalid? and, second, even if it is, can its enforcement by the city officials be enjoined? The answer to both of these questions seems to us plain.

"The ordinance can be justified only as an exercise of the city's police power. This power, is of course, very broad, but it is not without limitation. One limitation enforced in numerous cases is that an ordinance purporting to be an exercise of the city's police power 'may not be arbitrary or unreasonable.' The exercise of the police power cannot be made a mere cloak for the arbitrary interference with or suppression of a lawful business."

"Such being the law, was the present ordinance a reasonable one in its essential feature, that of prohibiting within the city any hospital for the treatment of contagious or infectious diseases? Such prohibition is very different from regulation, and can be justified only on the ground that such a hospital, no matter how well conducted, is a menace to the public peace, morals, health, or comfort. That a well-con-

ducted, modern hospital, even one for the treatment of contagious and infectious diseases, is not such a menace, but, on the contrary, one of the most beneficent of institutions, needs no argument. There is not the slightest danger of the spread of disease from it, and this is the only possible ground on which objection could be made to it. We have no hesitation in holding an ordinance prohibiting the maintenance anywhere within the city of an institution so necessary in our modern life and so beneficent to be wholly unreasonable and invalid.

"As to the second question, the enjoining of the enforcement of the ordinance, the rule is thus stated in *Abbey Land Co. v. San Mateo*, just referred to, 167 Cal. on page 440, 139 Pac. on page 1070, 52 L. R. A. (N. S.) 408, Ann. Cas. 1915C, 804:

"The doctrine that an action will lie to enjoin the enforcement of an (invalid) municipal ordinance in cases where such enforcement will cause substantial and irreparable injury to private property or private property rights, and in which there is no adequate remedy in the ordinary course of law, is now too well settled to require discussion.

"It is evident in the present case that the enforcement of the ordinance would cause substantial and irreparable injury to the plaintiff's property, and that against the threat of its enforcement by the repeated prosecutions which the ordinance permits the plaintiff has no adequate remedy. The case, therefore, comes within the rule stated in *Abbey Land Co. v. San Mateo*, and upon the facts alleged in the complaint the plaintiff was entitled to have the enforcement of the ordinance enjoined."

An Order Requiring Relocation of Street Railway Tracks Is Void in the Absence of Public Need

A decision of the Connecticut Supreme Court of Errors is an important addition to the body of judicial law affecting the right of cities and public service commissions to require public utilities to reconstruct their facilities situated in public places.

In the case passed upon (*Connecticut Co. vs. Town of Stamford*, 110 Atlantic Reporter, 554) it appears that for more than a mile along Hope Street in Stamford the street railway company's track is at one side, rather than in the center, of the street. The selectmen of the town ordered reloca-



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"Road - Razer"
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Just as the "ROAD-RAZER" is the solution to the summer rain problem, so is it the solution to the winter snow problem. It solves your problem of impassable streets, whether they are impassable because of mud or because of snow. The "ROAD-RAZER" shaves streets smooth when they are not frozen and keeps them open when the snow falls.

Every city can now have good, smooth dirt, gravel and crushed stone streets the whole year round at lowest possible cost. Here is the machine that will keep them good. Shaves the roughest, ruttiest streets smooth in a few minutes time. One man with this machine can keep many miles of city streets in good condition all year. It is the fastest, cheapest, most satisfactory method known of maintaining streets.

The scarifier attachment loosens up the "wash board" surfaces of rock and gravel roads and the "ROAD-RAZER" shaves the hard surface smooth, making the road better than when new.

It is the only machine of its kind, especially adapted to city street maintenance. It is a self-contained unit, with power and blades together, making it easy for one man to operate both machine and blades. Turns in its own tracks in three seconds and backs up instantly. Has wide, flexible, three-section, 12-foot blade that fits or shapes any curve or crown of the street. Equipped with powerful six-cylinder motor.

Sold on approval subject to demonstration and strongly guaranteed. A machine that has met the approval of city and country officials, street and road commissioners and taxpayers everywhere.



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tion of the track along the center of the street, and the order was affirmed on successive appeals to the Public Utilities Commission and the Superior Court of the county in which Stamford is situated. On further appeal, however, to the Supreme Court of Errors it is decided that the order is void for failure to show that the public safety or other public necessity requires the relocation. At the same time the Supreme Court recognizes the existence of broad powers in the public authorities to require public utilities to conform their affairs to public needs. But the circumstance that it would entail an expense of \$28,113 to relocate appellant's track is regarded as calling for a showing of some specific necessity for the relocation against its protest. Salient parts of the Supreme Court's opinion read:

"The maintenance and regulation of highways is within the police power of the state. The state may by itself or its agent decide what public improvement the public safety, health, or welfare demands.

"The power to legislate for the safety, health, or welfare of its people is inherent in the state in virtue of its sovereignty. All property is held subject to this power. . . . And all property, too, is held upon the implied promise of its owner or user that it shall not be used against the public welfare.

"The Connecticut Company accepted its charter and operated this railway line subject to the power of the state or its agent, the town, to so regulate its use that it might not do injury to the public welfare.

"When the conditions and locality change and the public welfare requires it, the street railway may be compelled to change its grade, or location, or the manner of its use of the highway. . . .

"The protection of the public safety, health, or morals by the exercise of the police power is not within the inhibitions of the constitution; and, since all property is held subject to such regulation, there is no obligation upon the state to indemnify the owner of the property from the damage done him by the legitimate exercise of the police power. Property so damaged is not taken; its use is regulated in order to promote the public welfare. . . .

"The police power, like every other power of government, is within constitutional limitations.

"Laws enacted presumptively for the public welfare, but in fact not, cannot be sustained as an authorized exercise of the police power. . . . And an act regulatory of this power which is oppressive, or unreasonable, is not a legitimate exercise of the power. . . .

"The railroad track laid in a public street, though by express public grant, is subject to such regulations as are reasonably necessary to

secure the public safety; for this power 'is inalienable even by express grant.' . . .

"Provided the order of relocation was made in the interest of public safety and was reasonable in the circumstances, the order was a valid order, even though no provision was made for indemnifying the railway company for the cost of relocation."

The opinion then proceeds to a conclusion that the order appealed from was invalid for omission of any showing that the present location of the track is dangerous to the public on the highway or to passengers on the cars, and failure to present the facts supporting a conclusion of the trial court that the relocation "would be distinctly proper and expedient and highly conducive to the safety of all concerned," etc.

Personal Interest of Official May Invalidate Municipal Contract

That a municipal official participating in an award of a contract for public work to a construction company is a salaried officer of that company gives him such interest in the transaction as will justify a reletting of the contract, on discovery of his relationship to the company, holds the Wisconsin Supreme Court in the case of *Edward F. Gillen Co. v. City of Milwaukee*, 183 Northwestern Reporter, 679. It is also held that the disqualification of the company is not removed by the official's resigning his position with the company after award of the contract.

The Court justifies defendant city's sewerage commission in rescinding a contract for construction of a sewage disposal plant on discovery that one of the commissioners who voted to award the contract was employed by the contracting company at an annual salary of \$4,500 as superintendent. But it is intimated that the mere fact that a municipal officer may be employed by a contractor will not vitiate a contract where there is no real conflict of interests.

Holding that another commissioner was not disqualified to vote to award the contract to another company by reason of the fact that he formerly was a stockholder and officer of that company, nor because his son was interested in and an officer of the company, the Court adds that "the decisions are to the effect that contracts may be legally made by a municipality although a relative of the bidder is one of the governing board or council. In such case there is no direct or indirect interest in the contract."

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In Baker Snow Plows you get the highest type of snow plow made. Patent, hinged, spring-supported blades prevent injury to the plow. Used only on Baker Snow Plows. Simple, sturdy, practical construction—the result of our long experience in making snow plows. We can help you move snow. Make your motor trucks and tractors useful all year 'round.

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Time was when asphalt was considered exclusively a city type and thought to be too luxurious for country highways. NOWADAYS THE YARDAGE ON COUNTRY HIGHWAYS EXCEEDS THE COMBINED PAVING PROGRAMS OF ALL CITIES.

The swing to asphalt on state roads is very marked in the states which, prior to 1920, favored other types.

The California State Highway Commission increased its asphalt yardage 1800 per cent in 1921 as compared with 1920, the figures being 1,208,366 square yards and 67,500 square yards respectively.

New York State Highway Department has increased its contracts let for asphalt yardage by over 300% in 1921 as compared with 1920; the figures being 2,643,000 square yards and 649,000 square yards respectively.

North Carolina within the past three months has contracted for 1,697,000 square yards of asphalt pavement.

ASPHALT IS THE GREATEST WATER-PROOF ADHESIVE FOR PAVING KNOWN TO MAN.

It forms in combination with stone, sand and gravel a slab highly resistant to impact.

It is absolutely dustless.

It is waterproof.

It is self healing when cut or scarred.

It is low in maintenance cost and, contrary to the popular impression, it is not expensive to construct.

BEST OF ALL: It is the most durable pavement within ordinary cost limits yet devised. The Engineer Department of Washington, D. C., in the annual report for fiscal year ended June 30, 1921 (page 25) says, referring to asphalt streets: "It should be considered that some of the streets approximate an age of 40 years and that the average age of those we have resurfaced in recent years exceeds 25 years."

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DANIEL H. BURNHAM, ARCHITECT, PLANNER OF CITIES

Charles Moore. Houghton Mifflin Company, Boston. 2 vols. Illustrated. 1921. X + 250, and 238 pp. \$20.

"I venture to say that there was no man in the professional life of the United States who has given more of his life to the public without having filled public office, than Daniel Burnham." So wrote President Taft, on hearing of the death of the subject of these volumes. Preeminent among the architects of his generation, Burnham was also a pioneer in city planning, and his plans for Washington, Cleveland, San Francisco, Manila and Chicago are his enduring monument. These two volumes, excellently printed and illustrated with numerous pictures, many of them in color, are the history of a kindly and enlightened personality, as well as a record of professional accomplishment of the highest order.

TAXATION OF FEDERAL, STATE AND MUNICIPAL BONDS

John H. Hoffman and David M. Wood, of the New York Bar. 1921. The Bond Buyer, New York. 130 pp. \$5.

The subject is approached from the legal side, without economic considerations. The volume consists of two parts, the first being devoted to a discussion of the principles of the law of taxation as applied to the United States and its governmental subdivisions, state, colonial and municipal. Part two is an exhaustive analysis, in tabulated form, of the tax laws of the United States and each state and territory with reference to such bonds. The text is exhaustively annotated to afford complete reference to statutes and court decisions, with a table of cases.

THE CONFLICT

Gertrude K. Colby, B.S., Department of Physical Education, Teachers College, Columbia University, with an introduction by Thomas D. Wood, A.M., M.D., Professor of Physical Education, Columbia University. A. S. Barnes and Company, New York. 1921. 70 pp. Illustrated. \$1.50.

A health masque in pantomime.

THE CONFERENCE OF GOVERNORS

Proceedings of the Twelfth Conference of Governors of the States of the Union, held at Harrisburg, Pa., Dec. 1-3, 1920. Includes the Articles of Organization of the Conference, and papers in full. (Apply to M. C. Riley, Secretary, Governors' Conference, Madison, Wis.)

NEW YORK STATE INDUSTRIAL COMMISSION

Annual Report of the Industrial Commission, State of New York, Department of Labor, for the year ended June 30, 1920. Published as Legislative Document No. 88. (Apply to E. W. Buckley, Secretary, Industrial Commission, Department of Labor, Albany, N. Y.)

CHEAP MEALS FOR SCHOOL CAFETERIAS AND PUBLIC INSTITUTIONS

"Ten-Cent Meals." Bulletin of the American School of Home Economics, as No. 34, Series I. 10 cents. This pamphlet is part of the book "Low Cost Cooking," by Miss Florence Nesbit, Field Supervisor and Dietitian of the Department of Relief of the Juvenile Court of Chicago. The book will be found of value by individuals and organizations engaged in relief work, as well as by those in charge of school cafeterias and institutions. (Apply to The American School of Home Economics, 506 West 69th Street, Chicago, Ill.)

REGULATIONS FOR CENTRAL PURCHASING BY CITIES

Model System and Rules and Regulations for Central Purchasing by Cities. Data gathered by the New York State Bureau of Municipal Information. 7 pp. mimeographed. December, 1921. (Copies not available for general distribution; apply to William P. Capes, Secretary, New York State Conference of Mayors, 25 Washington Avenue, Albany, N. Y.)

A HALF CENTURY OF PUBLIC HEALTH

Edited by Mazyck P. Ravenel, M.D. American Public Health Association, New York. 1921. 461 pp.

An outstanding volume of facts, giving the history of public health in North America during the most intensive fifty years of public health work. An invaluable summary of activities in public health work, including bacteriology, mortality statistics, quarantine, the control of disease, water purification, sewage and refuse removal, industrial waste, food control, food conservation, milk, child welfare work, housing, ventilation, industrial hygiene, medical entomology, and public health nursing. The foremost experts, engineers and medical men in the different fields contributed the chapters of this valuable encyclopedia of public health activity.

THE MANAGEMENT OF MEN

Edward L. Munson, Colonel General Staff, Chief, Morale Branch, War Plans Divisions. Henry Holt and Company, New York. 1921. XIII + 799 pp. \$6.

Although designed primarily to meet the problems involved in the management of soldiers, the principles enunciated are equally applicable to the successful handling of men in the daily affairs of civil life.

INTRODUCTION TO THE SCIENCE OF SOCIOLOGY

Robert E. Park and Ernest W. Burgess, of the Department of Sociology, University of Chicago. The University of Chicago Press, Chicago, Ill. 1921. XXI + 1,040 pp. \$4.75, postpaid.

A collection of readings selected to define and illustrate the concepts and principles of sociology. It is designed for the first course in sociology and combines the features of a text-book and a reference library.

MIND TRAINING FOR CHILDREN

William E. Miller, author of The Natural Method of Memory Training. Published by the author, Alhambra, Calif. 3 booklets. 1921. Illustrated. \$5.

The first booklet takes up the training of the child's senses; the second, the training of the memory; and the third applies the processes developed in the first two to the child's school work. This series has been very highly praised by Thomas A. Edison.

LECTURES ON ENGINEERING PRACTICE

The J. E. Aldred Lectures on Engineering Practice. Edited by John B. Whitehead, Dean of the Faculty of Engineering, Johns Hopkins University. Published by The Johns Hopkins Press, Baltimore, Md. 1921. 285 pp. illustrated. A series of nine lectures on practical phases of engineering. Three lectures each are devoted to civil, mechanical and electrical engineering. (Apply to John B. Whitehead, Dean, Faculty of Engineering, Johns Hopkins University, Baltimore, Md.)

PUBLIC HEALTH NURSING

Manual for Public Health Nurses. Published by the New York State Department of Health, Hermann M. Biggs, M.D., Commissioner, 1920. 261 pp. Covers in convenient form all subjects in the field of public health nursing. (Apply to Hermann M. Biggs, Commissioner, New York State Department of Health, Albany, N. Y.)

PENOLOGY

Proceedings of the Annual Congress of the American Prison Association, at Columbus, O., October, 1920. 1921. 469 pp. \$3. Proceedings of the Congress, with all papers in full. (Apply to O. F. Lewis, General Secretary, Central Office, American Prison Association, 135 East 15th Street, New York, N. Y.)

THE SINGLE TAX IN OPERATION

"Enclaves of Single Tax," by Fiske Warren, with a historical description by Charles White Huntington. 1921. 150 pp. Maps. 25 cents. A compendium of legal documents involved in the organization of the various single-tax colonies in the United States and Europe, and general descriptions of those communities. Among those described are Fairhope, Ala., Arden, Del., and Sant Jordi, Andorra. (Apply to Fiske Warren, Harvard, Mass.)



Dallas Cuts Its Garbage Disposal — Costs \$60,000 a Year

The "Caterpillar's" usefulness is not limited to hauling garbage. For grading streets and roads, removing snow, working on farm or ranch, in the mining, oil and lumber industries—wherever power and endurance are at a premium, the "Caterpillar"* has no real competitor*

Dallas, Texas, has found the "Caterpillar"* method of hauling garbage disposal trains a guarantee of better, cheaper work. With "Caterpillar"* hauling the refuse is handled quickly and safely regardless of muddy alleys, slippery pavements, heavy grades, and soft trash piles. A 5-ton "Caterpillar"* takes a 12-yard load to the Dallas burning pit in less than thirty minutes from collection points three miles away. It reduced the hauling cost from \$2.00 a yard to a fraction over \$.25, with a consequent saving to the City of more than \$60,000 a year. Write for further facts and figures on the economy of "Caterpillar"* methods for hauling, grading, leveling and other public works.

**There is but one "Caterpillar"—Holt builds it*

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HEALTH OF SCHOOL CHILDREN

"A Preliminary Study of Standards of Growth in the Detroit Public Schools," by Paul C. Packer and Arthur B. Mochlman. 46 pp. Illustrated. 1921. This is the June number of "The Detroit Educational Bulletin," published by the Board of Education, Detroit, Mich. (Apply to Stuart A. Curtis, Director of Instruction, Teacher Training and Research, Detroit Public Schools, Detroit, Mich.)

NATIONAL CONFERENCE ON CITY PLANNING

Proceedings of the Thirteenth National Conference on City Planning, held in Pittsburgh, May 9-11, 1921. 1921, 206 pp. Full text of the papers presented to the Conference. \$2.25. (Apply to Flavel Shurtleff, Secretary, National Conference on City Planning, 60 State Street, Boston, Mass.)

FIRE PREVENTION DAY IN PENNSYLVANIA

"Make Pennsylvania Fireproof." 11 pp. Illustrated. Suggestions for the observance of Fire Prevention Day. Issued by the Bureau of Fire Protection, Department of State Police, Harrisburg, Pa. (Apply to publishers.)

FIRE REPORT FOR IOWA

Tenth Annual Report of the State Fire Marshal for the year 1920. 32 pp. 1921. (Apply to J. A. Tracy, State Fire Marshal, Des Moines, Iowa.)

ILLINOIS FIREMEN'S ASSOCIATION

"Thirty-third Annual Convention of Illinois Firemen's Association." 176 pp. Illustrated. 1921. (Apply to Roy Alsip, Secretary, Illinois Firemen's Association, Champaign, Ill.)

DETROIT PARKS

"Detroit, Its Parks and Recreational System," with the Annual Convention Program of The American Association of Park Superintendents. 40 pp. Illustrated. 1921. Published by "Parks and Recreation," Minot, N. D. (Apply to publishers.)

THE MERCHANTS' ASSOCIATION OF NEW YORK

Year Book of The Merchants' Association of New York. 337 pp. Illustrated. With alphabetical and

classified list of members. (Apply to S. C. Mead, Secretary, Woolworth Building, 233 Broadway, New York, N. Y.)

LETCHWORTH VILLAGE

"Twelfth Annual Report of the Board of Managers of Letchworth Village." The Village is under the auspices of the New York State Board of Charities, Division of Mental Defect and Delinquency. Published as Legislative Document (1921) No. 68. 64 pp. Illustrated. (Apply to Frank A. Vanderlip, President of the Board of Managers, 7 Wall St., New York City, N. Y.)

PUBLIC UTILITIES

"Report of the Committee on Public Utilities" of the Chamber of Commerce of Newark, N. J. 8 pp. 1921. (Apply to Edmund W. Wollmuth, Secretary, Chamber of Commerce, Newark, N. J.)

CITY PLANNING

"The City Plan and Living and Working Conditions," by John Ilder, Manager, Civic Development Department, Chamber of Commerce of the United States. An address delivered before the National Conference on City Planning. 15 pp. 1921. (Apply to author, Washington, D. C.)

MUNICIPAL MOTOR EQUIPMENT

"The City of Toronto as a Car Owner," published as City Budget Story No. 2, by the Bureau of Municipal Research, Toronto, Can. Brief statement of the experiences of other cities, with suggestions for increased efficiency and reduced costs. (Apply to publishers.)

SAFETY FOR CHILDREN

"Safety Lessons," suggestions prepared for teachers in the Chicago public schools. 11 pp. 1921. (Apply to Peter A. Mortenson, Superintendent of Schools, Chicago, Ill.)

MILK SUPPLY

"Report of the Commission on Milk Supply." 26 pp. 1921. Printed and distributed by The Newport Improvement Association. (Apply to The Newport Improvement Association, Newport, R. I.)

Municipal Reports

Baltimore, Md.—Annual Report of the Comptroller for the fiscal year ending December 31, 1920. (Apply to Peter E. Tome, Comptroller, Baltimore, Md.)

Bellingham, Wash.—City Comptroller's Annual Report. 1920. (Apply to Charles A. McLennan, City Comptroller, Bellingham, Wash.)

Boston, Mass.—Seventh Annual Report of the City Planning Board, for the year ending January 31, 1921. (Apply to Elisabeth M. Herlihy, Secretary, City Planning Board, Boston, Mass.)

Chicago, Ill.—Annual Reports of the Department of Public Service, for the years 1916 to 1920, inclusive, ending December 31, 1920. (Apply to William H. Reid, Commissioner of Public Service, Chicago, Ill.)

Chicago, Ill.—Twelfth, Thirteenth, and Fourteenth Annual Reports of the Municipal Court, for the three years, December 2, 1917, to December 5, 1920, inclusive. (Apply to James A. Kearns, Clerk of the Municipal Court, Chicago, Ill.)

Chicago, Ill.—Annual Report of the Treasurer for the fiscal and calendar year 1920. (Apply to Henry Stuckart, City Treasurer, Chicago, Ill.)

Chicago, Ill.—Financial Summary. Report of the Comptroller for the fiscal year ended December 31, 1920. (Apply to George F. Harding, Comptroller, Chicago, Ill.)

Chicago, Ill.—Forty-fifth Annual Report of the Department of Public Works, for the year ending December 31, 1920. (Apply to Charles R. Francis, Commissioner of Public Works, Chicago, Ill.)

Chicago, Ill.—Report of the Chicago Railway Terminal Commission. (Apply to John F. Wallace, Chairman, Chicago Railway Terminal Commission, 140 North Dearborn Street, Chicago, Ill.)

Chicago, Ill.—Eleventh Annual Report of the Chicago City Plan Commission, for the year 1920. Proceedings of the Twentieth Meeting of the Commission. (Apply to Eugene S. Taylor, Office Manager, Chicago Plan Commission, Roof F, Hotel Sherman, Chicago, Ill.)

Detroit, Mich.—Seventy-eighth Annual Report of the Superintendent of Schools, for the school year ending June 30, 1921. (Apply to Frank Cody, Superintendent of Schools, Detroit, Mich.)

Evansville, Ind.—Annual Report of the Comptroller and Water-Works Department for the fiscal year ending December 31, 1920. (Apply to William H. Elmen-dorf, Comptroller, Evansville, Ind.)

Fall River, Mass.—Annual Report of the Board of Health for the year ending December 31, 1920. (Apply to Frank L. Larkin, Secretary, Board of Health Fall River, Mass.)

Fort Wayne, Ind.—Sixteenth Annual Report, Board of Park Commissioners, for the year 1920. (Apply to David N. Foster, President, Board of Park Commissioners, Fort Wayne, Ind.)

Hartford, Conn.—Sixty-first Annual Report of the Board of Park Commissioners, and the Thirteenth Annual Report of the Public Cemeteries, for the year ending March 31, 1921. (Apply to E. Spencer Goodwin, President, Board of Park Commissioners, Hartford, Conn.)

Newark, N. J.—Annual Report of the Department of Health, for the year ending December 31, 1920. (Apply to Charles V. Craster, M.D., Health Officer, Newark, N. J.)

New York, N. Y.—Report of the Chief Engineer of the Board of Estimate and Apportionment for the year 1919. (Apply to the Chief Engineer, Board of Estimate and Apportionment, Municipal Building, New York, N. Y.)

Philadelphia, Pa.—Annual Report of the Department of Wharves, Docks and Ferries for the year ending December 31, 1920. (Apply to George F. Sproule, Director, Department of Wharves, Docks and Ferries, Bourse Building, Philadelphia, Pa.)

Philadelphia, Pa.—Annual Report of the Bureau of Highways, Department of Public Works for the year ending December 31, 1920. (Apply to Fred C. Dunlap, Chief, Bureau of Highways, Department of Public Works, Philadelphia, Pa.)

Pocatello, Ida.—Annual Financial Report of Bannock County, Idaho. 1920. (Apply to Robert C. Earley, County Auditor, Box 1288, Pocatello, Idaho.)

Waltham, Mass.—Annual Reports for 1920, with the fourth annual address of Hon. George R. Beal, Mayor. (Apply to Richard Steele, City Clerk, Waltham, Mass.)



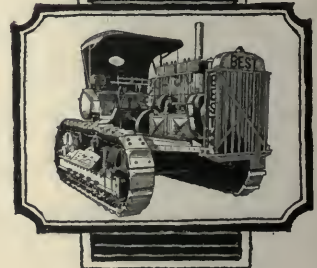
Cheaper power with tractors

Tractors are proving profitable equipment for road-builders in all parts of the country—profitable because of the time saved on a given piece of work, and because of the fewer hands required.

With a BEST TRACKLAYER TRACTOR the contractor can go ahead with his work in most any weather. He moves more earth and makes a better, smoother job. His power is steady, dependable, flexible and compact. He can negotiate grades without difficulty, and in faster time.

BEST TRACTORS have proven their mettle over a period of many years in all parts of the world. They have earned a reputation for dependability, power and low cost of operation. BEST design and workmanship have been established by time and the test of actual, practical usage on a large variety of heavy-duty work.

Write for full data, prices and the names of our nearest dealers. Let us give you the details of how Best Tractors are serving road-builders.



BEST
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There are three models of Best Tracklayer Tractors as shown above. All are factory built—not assembled

Methods, Materials and Appliances

News for Boards of Public Works, Engineers, Contractors, Purchasing Agents, and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

Snow-Plow in Winter— Grader in Summer

The one-man "Road-Razer" manufactured by the Avery Company, Peoria, Ill., which has operated successfully in many cities and towns in helping solve the maintenance problem of dirt, gravel and crushed stone roads, has been put to use as a snow-plow with considerable success. This machine is made specifically to grade rough, rutty roads, and with a scarified attachment has torn up gravel, crushed rock and oil roads and smoothed them down to proper shape. It has also in some instances replaced the grade leveler, preparatory to laying hard roads, and has been used to spread gravel and crushed stone.

In Salina, Kans., the Street Commissioner has successfully used it for cleaning the snow off the city streets. One man operating the machine cleaned off several miles of streets in a single day after a heavy snow at very little expense.

In Great Bend, Kans., one of these machines cleaned off a half-mile of wide street on two sides of a public square, removing ten inches of snow, some of it packed and frozen into ice. The machine was run along the curb first, cleaning out the gutter, leaving ridges of snow piled out in the street about 6 feet from the gutter. Where the street is wide and the snow deep, it is well to start along the sides and throw the first round out in the street up against what has been thrown from the gutter. In this way no more snow is accumulated than the blade can readily handle. By lengthening the rear blade

about a foot the work is speeded up.

These city officials have been enthusiastic over the work of the machine both as a road grader in keeping their dirt and gravel roads in trim and in its work in handling snow.

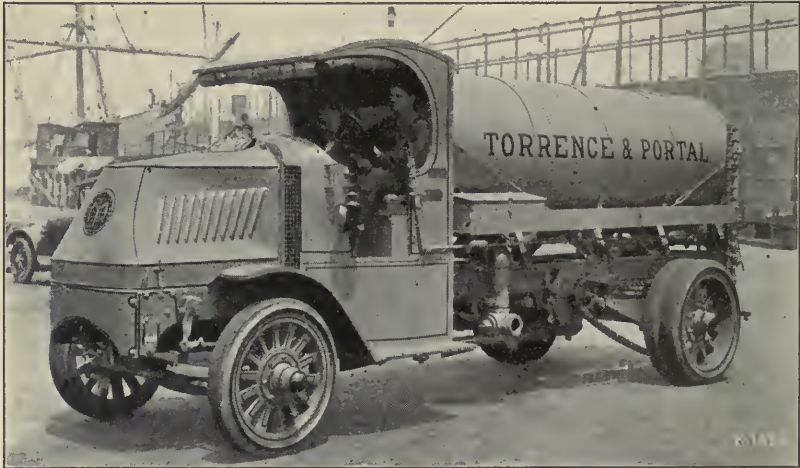
Series Multiple Street Lighting

Great advances have been made during recent years in the field of street illumination, due in large part to the high state of development of the tungsten lamp. There have been many systems of street lighting developed, but the one using series regulators or regulating transformers seems to have perhaps the largest number of advocates. The series regulators or regulating transformers are an improvement over the older types of street lighting using arc light generators, but in both cases a large initial expense is involved and the cost of operation and maintenance is rather high, while the power factor and efficiency are low. The introduction and development of a low-voltage series tungsten lamp makes it possible to use other systems of regulation that give a very high power factor and efficiency, are somewhat cheaper to install and maintain, and within reasonable limits give better regulation and are more flexible.

The average flaming arc lamp gives about 500 candle-power. When placed at street intersections, they are about 300 feet apart. This same candle-power divided into 5 units of 100 candle-power each allows the lamps to be placed every 60 feet, which means a somewhat more uniformly distributed illumination and a more pleasing effect. This result is made practical



CLEARING SNOW FROM THE STREETS OF SALINA, KAN.



The Mack Light Bituminous
Material Distributor



Your road maintenance next Spring

Now is the time to get ready

INCLUDED in our unusual line of special motorized equipment for municipalities, counties and contractors is this Mack Light Bituminous Material Distributor.

This equipment is a fool-proof machine for handling cold material and requires only a driver for its operation. The elimination of the extra operator which is usually needed on ordinary machines, means economy for its owner.

The tank body can be demounted when its particular work is done and a dump body substituted. This continuous chassis use effects large savings and many highway boards and commissioners are finding this a practical way to economize on their road maintenance equipment.

INTERNATIONAL MOTOR COMPANY
25 Broadway, New York

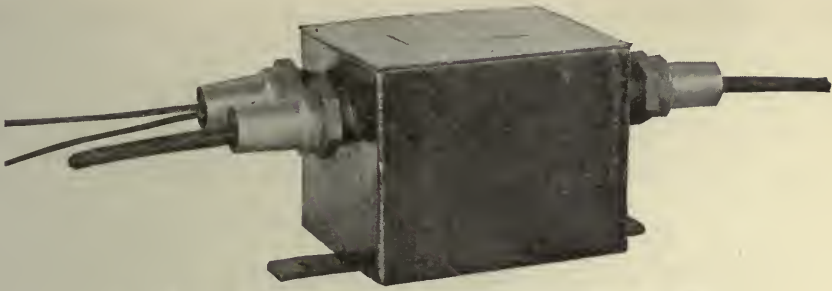


Capacities:

1½ to 7½ tons.

Tractors to 15 tons.

PERFORMANCE COUNTS



A COMPACT TYPE OF STREET LIGHTING TRANSFORMER

only by the use of low-voltage series tungsten lighting systems. Two general systems have been developed by the Kuhlman Electric Company, Bay City, Mich., one styled the type S.M. system, and the other the type B.L. system. Each has its several modifications which cover a wide field of adaptability and which enable them to fit almost any lighting conditions that may arise. A series arc regulator is unnecessary in the type S.M. system, but it may be used in the type B.L. system. Both systems are designed for overhead or underground operation.

The type S.M. or series multiple system may be furnished in two forms, one using a small current transformer at each lamp, and the other using a reactance coil at each lamp. In each system the primary circuit may be any power circuit or a separate circuit taken from the power-house or substation for street lighting purposes only. The best potential for this primary circuit is 2,300 volts, and the circuit needs only such protection as would be given any 2,300-volt power line. As many individual lighting circuits can be taken from this power circuit as the kilovolt-ampere capacity of the circuit will allow.

A constant potential transformer which has neither moving coils nor extra reactance is connected across the line, and a series circuit is taken off the secondary of this transformer. The kilovolt-ampere of these transformers is governed by the ampere capacity of the secondary and the maximum number of lamps on the circuit. The transformers are designed for 3.5-, 4-, 5.5- 6.6- or 7.5-ampere secondary, depending on which is desired; the 6.6-ampere system is most used. The secondary also has a series of standard taps for reducing the secondary voltage to conform to the number of lamps in operation. These taps are brought out of the case so as to be readily accessible when making a change.

The system using a reactance coil at the lamp is the least expensive, but has a disadvantage in having the high-voltage line wires at the lamp, making it dangerous to replace the lamp while the current is on. With a current transformer in the base of the lamp-post or on a pole, the secondary wires can be carried to the lamp, and it is perfectly safe to make a lamp change without shutting off the current, as there is a heavy insulating barrier between the primary and the secondary windings. When a lamp goes out, the open-circuit voltage of the transformer will rise

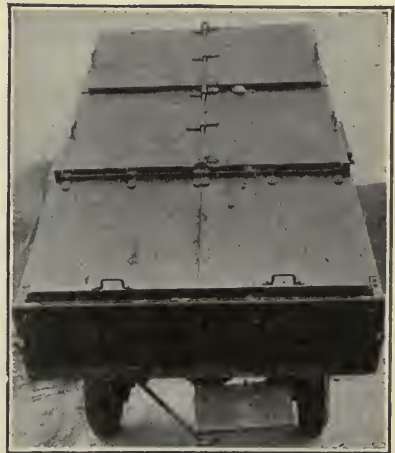
only from $2\frac{1}{2}$ to 3 times the normal lamp voltage, which is a negligible quantity. Each lamp is wholly independent of the rest and, no matter what happens to any individual lamp, it cannot affect the remainder of the circuit.

Dump Bodies for Garbage Trucks

The Heil Company, Milwaukee, Wis., has placed on the market a special body designed for the handling of garbage in municipalities. Two types of garbage bodies are made. The standard dump body type illustrated is equipped with six hinged doors, two of which open to the back, the other four to the side. It has a special water-tight tail gate fitted with wing nuts. A $\frac{3}{8}$ -inch rubber gasket is used for packing. All seams are electrically welded after being riveted to make them water-tight, preventing liquid garbage from dripping on the street.

This same body is furnished without covers, in which case rings are provided along the side so that a canvas tarpaulin can be tied on, to comply with city ordinances. This type of standard garbage body can be used for hauling gravel and sand wherever desired.

The other type of body has the bottom or floor tapered upward in the rear. This floor can extend to the end of the body or only part way. In the latter case a tail gate is used.



A STANDARD GARBAGE BODY FITTED WITH COVERS

TIFFIN

STREET FLUSHERS

Licensed under Ottogy Patent No. 795059



We Welcome Any Test Based on Work and Cost

We believe we can prove by service records or by any test you might arrange, that Tiffin Street Flushers will clean more pavement in a day at less cost than any other machine. Also, the work accomplished will be better done.

If we can prove that, we've done all any city street department can want.

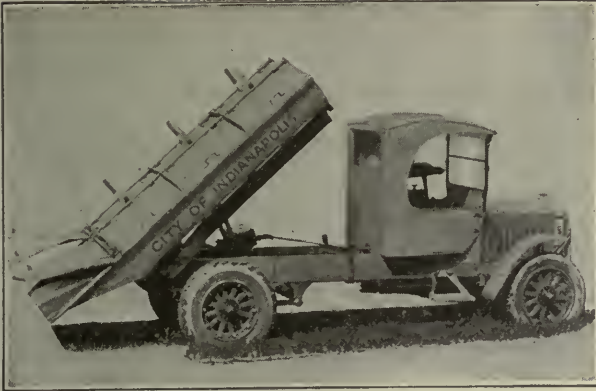
The two-motor-system design, and the operating technique, are the causes, but the result obtained is the matter of chief interest to you.

Let us submit evidence—
Do you want a demonstration?

The TIFFIN WAGON Company

TIFFIN, OHIO

Makers, also, of Tiffin Municipal Trucks, Dump and Farm Wagons, etc., etc.
Representatives in Principal Cities



THE REAR COVERS OPEN AUTOMATICALLY

The sides of garbage bodies should be made as low as possible to facilitate loading. The hydro hoist employed in all Heil dump trucks is therefore specially desirable, as all of the loading space back of the cab can be used for actual load.

The garbage dump body and the No. 4 hydro hoist is mounted on a 1½-ton chassis. The sides of the body are low; the covers are raised at the center to allow maximum load. Brake lining is used along the edges of the covers to make them fit tightly.

Crowley, La., Buys Diesel Engines for Municipal Power-Plant

The city of Crowley, La., has just purchased two Diesel engines developing, respectively, 285 brake horse-power and 380 brake horse-power, from the Fulton Iron Works, St. Louis, Mo. With this equipment the municipal power-plant at Crowley will compare quite favorably in economy with the larger central stations of the South.

George A. Johnson Company Moves Office

Because of the steady increase in amount and scope of the work of the George A. Johnson Company, Consulting Engineers, 150 Nassau Street, New York City, for some months past, they have recently moved to larger quarters. They are located in the same building, in Suite 1121-1129. The new layout is designed to meet efficiently the executive demands of their increasing business.

Chamber of Commerce Counts Ballots by Machine

Ballot-counting by machine has been introduced by the Bristol, Conn., Chamber of Commerce. Automatic counters made by the Root

Company, one of the prominent manufacturing establishments of that city, were used to count the vote in the primary and the final elections just completed. The use of these machines greatly expedited the work of the tellers. Use of the counters was arranged by J. T. Chidsey, president of the Root Company, who was reelected president of the Chamber of Commerce. The Bristol Chamber has a splendid record of worth-while accomplishments to its credit. It recently undertook a successful expansion campaign under the direction of the American City Bureau, 154 Nassau Street, New York City.

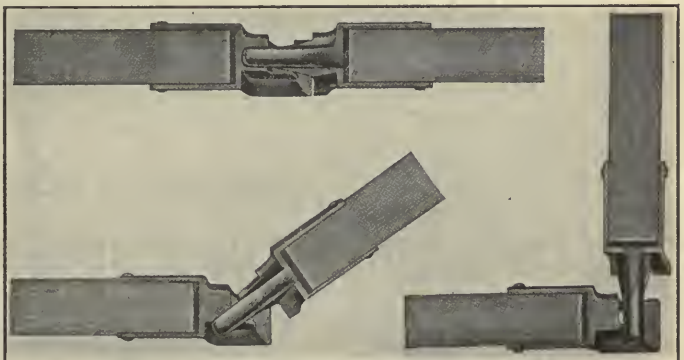
New Cletrac Advertising Manager

The announcement has been made by the Cleveland Tractor Company, Cleveland, Ohio, that Earl B. Stone has been appointed Advertising Manager, effective December 15. After 2½ years with this company, serving as Sales Representative, Assistant Advertising Manager and District Sales Manager, Mr. Stone is well qualified to assume his new duties. His former advertising experience included work with the General Fireproofing Company of Youngstown, Ohio, and the National Acme Company of Cleveland, Ohio.

Non-buckling Sewer Rods

In the course of maintenance of sewers, there are many minor obstructions that can be readily removed by means of wooden sewer rods. The Turbine Sewer Machine Company, 195 11th Street, Milwaukee, Wis., manufactures a non-buckling wood sewer rod that is water-proof and will float in 2½ inches of water. It is used chiefly in pulling cable or rope through a sewer or in clearing away minor obstructions. The couplings are such that they can be joined or uncoupled instantly.

This company also manufactures the well-known Turbine sewer cleaning machine, which will remove roots, stones and any other obstructions in any size of circular sewer.



SEWER RODS, SHOWING LOCKING DEVICE

WILLITE

TEMPERED ASPHALT PAVEMENT—THE MASTER HIGHWAY



Photo After Carrying Over 4,000,000 Tons Traffic on Los Angeles County Boulevard, equal to 15 years normal use. One of the heaviest trafficked lines in the world.

WILLITE TEMPERED ASPHALT "TAKES THE FAULT OUT OF ASPHALT"

Before you call for bids, investigate, then specify WILLITE, the Strongest Road in the World. It has proven to be the best in 15 states under the severest service tests ever made. Traffic cannot mar the beautiful, smooth, resilient, water and frost-proof roadway of WILLITE.

In the Imperial Valley Desert of California where the temperature ranges from freezing to 130 degrees F., the experimental WILLITE roads, 5 inches thick, proved so successful, after all other types of asphaltic roads had failed, that 10 miles of WILLITE paving have since been built.

Let us send you our literature and proof of the superiority of WILLITE.

WILLITE ROAD CONSTRUCTION COMPANY
OF AMERICA

711 Union Trust Building

Detroit, Michigan

To learn some interesting facts regarding WILLITE read pages 24 and 26 in the April 16, 1921, issue of the *Saturday Evening Post*. Read lines 11 to 27, inclusive, on page 26, very carefully.

See Our Exhibit
at the Good Roads Show
Chicago, Jan. 16-20, 1922

Street and Parkway Lighting Standards

The municipal official when seeking a lighting standard for use on a city street, parkway or boulevard, has in mind a standard which will be permanent, durable and attractive both during the daytime and when illuminated at night.

The lighting standards made by Caldwell & Drake Iron Works, Inc., Columbus, Ind., are made of high-quality iron of the same type as is used in automobile cylinder and ammonia compressor castings.

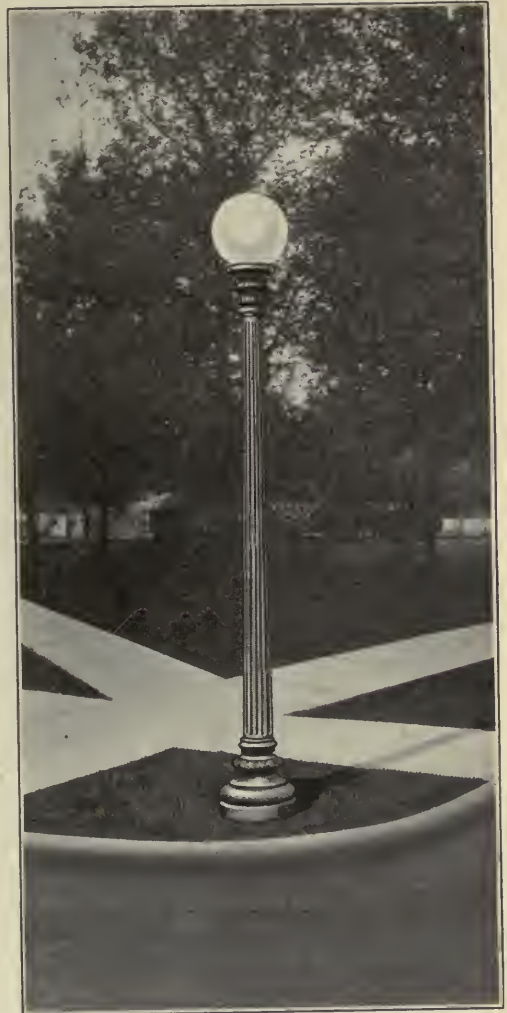
Since the posts are of heavy cast metal, they resist rust and corrosion admirably. The special patented connection used in fastening the post to the foundation insures that they may be struck by vehicles without breakage other than possibly the glassware and special angle clamps. After accidents the posts can be set up in a few minutes ready for service. When the posts are erected in accordance with the plans of the manufacturer, they cannot be thrown onto the street or sidewalk, at the risk of killing or injuring pedestrians or those riding by. Thus possible damage suits are avoided—a matter worthy of consideration. It is claimed that these posts are not defaced nor deformed by impact with vehicles. When other types of posts are broken by impact, they must be either scrapped or repaired by welding, which leaves marks permanently defacing the posts. It is very difficult to repair those which are dented or bent by impact.

All standard equipment, such as globes, sockets, potheads, etc., can be used with these posts, and they will also fit on most of the present foundations without the need of changing the foundation bolts. In erecting the bolts, the special angle clamps make them very easy to assemble, in that the post is set up on the foundation, the angle clamps slipped over the foundation bolts, and the nuts placed on and screwed down.

Cutting Pipe in the Trench

A new pipe-cutting device which has the particular advantage of being able to cut pipe in the ditch with considerable speed has been placed on the market by the Ellis & Ford Manufacturing Company, Detroit, Mich.

In this machine every point in contact with the pipe is a cutting disc. Therefore, when the cutter is adjusted on the pipe it is only necessary to move it through a small arc in order to cut entirely around the pipe. In placing the cutter in position in the trench, as shown in the illustration, one of the thumb bolts is slipped out and the links run under the pipe and locked back together. The handle can be placed in any position on the rod, so as to cut in a very narrow trench. In cutting the pipe in the trench, only room enough is required to pass the length carrying the cutter wheels underneath the pipe, a feature which water-works men will appreciate particularly when they know the troubles of operating in a hard-rock trench. In making ordinary repairs or inserting specials in a line



LIGHTING STANDARD IN COMMERCIAL PARK, COLUMBUS, IND.

of pipe, the work can be completed with the aid of the cutter in the same space of time it would take to dig a hole so as to make a cut with hammer and chisel. In addition, the cuts are made clean and smooth, eliminating the danger of breaking the pipe or disturbing the joints.

On cast iron pipe the wheels do not cut through the pipe, but when a groove has been cut around the pipe to a reasonable depth, a little extra pressure on the screw and handle will cause the pipe to crack off. On a 12-inch water-main, this cut will not exceed $\frac{1}{8}$ -inch in depth.

Burnap Preparing City Plan for Granville, N. Y.

Granville, N. Y., has engaged George Burnap, town and city planner, Washington, D. C., to prepare a comprehensive city plan, including the laying out of a park system.

Curious facts about streets as recorded in an engineer's note book

STREET	FROM	TO	L.A.I.D.	MATERIAL	ASPHALT YARDAGE	BRICK CUTTERS	TOTAL YARDAGE	AGE	ORIGINAL COST Per SQ. Yd.	TOTAL COST FOR REPAIRS Including 1921	REPAIRS Commenced	Maintenance Per Sq. Yd. Per Yr.	Total cost per Sq. Yd. Per Yr. including orig. Cost and Repairs
W.-NW	4th	5th	1917	Oil Asphalt "A"	376.68	85.81	462.49	4	1.44	\$324.30	1920	\$.175	\$.535
W.-NW	11th	12th	1915	Oil Asphalt "B"	796.25	77.29	873.54	6	1.49	19.20	1920	.00366	.252
W.-NW	12th	13th	1896	Trinidad	1181.38	176.92	1358.30	25	1.63	572.42	1910	.01686	.0821
W.-NW	13th	15th	1899	Bermudez	3707.21	660.35	4367.56	22	1.80	294.79	1911	.00307	.0849
W.-NW	15th	16th	1913	Bermudez	1931.53	126.92	2058.45	8	1.69	000.00	0000	.00000	.211

NOTE—MAINTENANCE FIGURES ARE FOR TOTAL YARDAGE.

ORIGINAL COST IS FOR ASPHALT ONLY.



GENASCO LINE

- Trinidad Lake Asphalt (For streets and roofs)
- Standard Trinidad
- Built-Up Roofing
- Bermudez Road Asphalt (For road building)
- Genasco Roll Roofing
- Genasco Sealbac Shingles
- Genasco Latite Shingles
- Genasco Vulcanite
- Mastic Flooring
- Genasco Acid-Proof Paint
- Genasco Industrial Paint
- Genasco Boiler Paint
- Genasco Asphalt Putty
- Genasco Asphalt
- Pipe Coating
- Genasco Asphalt
- Fibre Coating
- Genasco Tile Cement
- Genasco Water-proofing Asphalts
- Genasco Waterproofing Felts and Fabrics
- Genasco Battery
- Seal Compound
- Genasco Mineral Rubber
- Genasco Mineral Spirits
- Genasco Base Oils
- Genasco Flotation Oils
- Genasco Motor Oils
- Genasco Soluble Oils
- Genasco Saturated Asphalt Felt
- Genasco Deadening Felt
- Genasco Insulated Paper
- Genasco Red
- Sheathing Paper
- Genasco Stringed Felt
- Genasco Wall Lining
- Iroquois Road-building Machinery

Washington's Deadly Parallel

Astonishing! But the figures are official records on file in the office of the Public Works Department.

Trinidad and Bermudez are *native-lake asphalts*. "A" and "B" are manufactured oil asphalts.

Note the difference in age between the native-asphalt and the oil-asphalt sections. Then note their striking difference in cost, including maintenance and repairs.

The 25-year old Trinidad section has cost less than 2 cents per square yard per year to maintain. The four-year-old oil asphalt "A" already is costing nearly 18 cents.

Personally examined present condition of pavements. Oil asphalt "A" section is very bad after 4 years' service. Oil asphalt "B" section is still in fair shape. Trinidad and Bermudez sections are in splendid condition.

Washington's finest streets are paved with Trinidad and Bermudez. Their all-round superiority is clearly demonstrated. Would strongly advise their use on all streets where asphalt is desired.

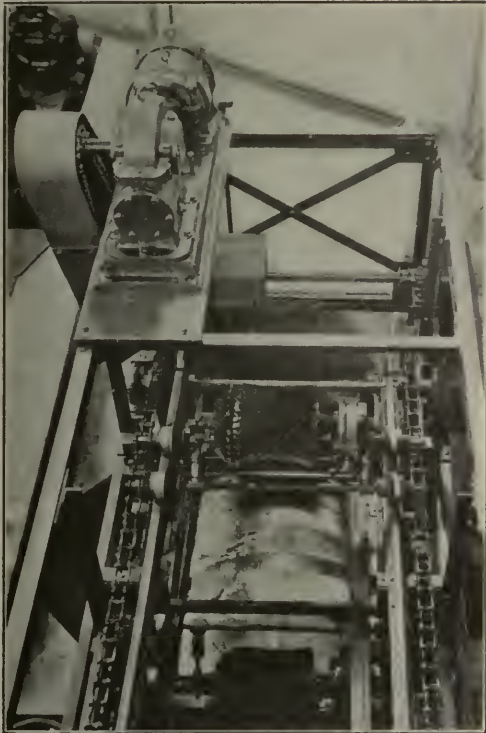
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PHILADELPHIA

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TRINIDAD LAKE ASPHALT



A VIEW OF SEWAGE SCREEN IN OPERATION

A New Type of Sewage Screen

To meet the increasing demand for fine-mesh sewage screens for municipal sewage disposal plants, the engineers of the Link-Belt Company, Philadelphia, Chicago, Indianapolis, have designed a new fine-mesh sewage screen which they claim combines great strength and rigidity with efficiency and reliability of operation. The screen surface proper is a cylinder, made either of perforated plates or the Link-Belt straight wire screen. The straight wire screen consists of bronze wires stretched tight on a bronze frame. The clear opening between the wires is $1/32$ -inch or less.

The sewage enters from the outside of the cylinder and is discharged at one end from the inside. Between 90 and 95 per cent of the total screening area is submerged, or, in other words, is effective. Seal rings separate the clarified from the raw sewage. The sewage screen is cleaned by revolving brushes which always travel in line with the open-

ings, but never across them. This feature and the small openings made possible by the straight wire screen insure the removal of all but the finest solids in suspension. No parts of the driving machinery are hidden, and all parts of the screen can be inspected and cleaned without interrupting the operation.

Two of these screens are now in operation at the sewage treatment plant of the city of Pleasantville, N. J., and are doing good work. From 70,000 gallons per day, one screen removes 4 cubic feet of sludge at a rate of 57 cubic feet per 1,000,000 gallons.

Convenient and Effective Lawn-sprinkling System

A frost-proof underground sprinkling system for parks, lawns and public grounds has been placed upon the market by John A. Brooks, 443 Penobscot Building, Detroit, Mich. It consists of a series of specially made sprinklers set level with the ground, to be out of the way of lawn mowers, and having underground pipe connections so arranged that the entire lawn may be watered by turning a single valve. After the sprinklers have operated any set length of time, the system is automatically shut off by a self-closing valve.

When not in use, the sprinkler is level with the ground and, all openings being completely covered, it can receive no injury from any use of the lawn. In operation an inner nozzle rises up above the grass, so as to give an unobstructed delivery of water. The sprinkler is made entirely of brass, has no moving parts to wear out, and is constructed to be proof from the surrounding dirt as well as from that in the water.

Installing this system does not mean that the lawn has to be marred by deep digging. The piping is placed only a few inches below the

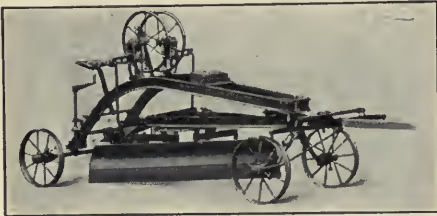


ROOSEVELT PARK, DETROIT, MICH., WITH ITS LAWN SPRINKLERS IN ACTION

THE BIG THREE

MEN MATERIALS & MACHINERY

were responsible for this road and every other good road ever built. Not the least of these three is Machinery. No road or street can be economically built or maintained without the use of modern machinery.



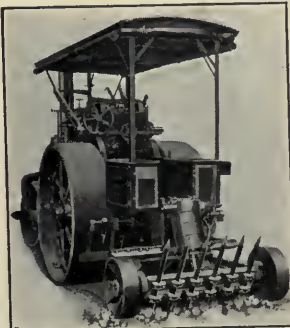
ROAD GRADERS.

A road grader is absolutely necessary in the construction and repair of dirt roads. We make six sizes of Winner Graders, as follows: The Baby Winner with a 5 foot blade; the Winner Patrol with a 6 foot blade; the Little Winner with a 6 foot blade; the Standard Winner with a 7 foot 6 inch blade; the Big Winner with an 8 foot blade, and the Giant Winner with a 10 foot blade.



ROCK CRUSHERS.

Wherever stone is available a rock crusher should be used. We furnish complete rock crushing outfits, portable or stationary, with capacities ranging from 50 to 1000 tons daily. Complete outfits consisting of crusher, elevator, screen, bin, power, etc., designed, built and installed.



ROAD ROLLERS.

The Monarch Steam Road Roller is a high class, standard roller made in 10 and 12 ton sizes. Rollers have ample engine and boiler power. They are flexible, dependable and extremely serviceable. Furnished with or without steam scarifiers.

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surface. A narrow strip of sod is taken up, and after the piping is down, the sod is carefully replaced so that it is scarcely possible to detect a blemish in the lawn. Although no part of the sprinkling system is placed below the frost line, the entire installation is made frost-proof by the use of an automatic draining sprayer. All piping slopes to the point where this sprayer is used, and as the water is shut off, the attached draining valve automatically opens, emptying the system. All use of hose and the labor required in sprinkling with the old method are eliminated by this system. In addition, the lawn is watered evenly and in a minimum time.

A New Garbage and Refuse Dump-Wagon

A new dump-wagon especially adapted for cities and towns where garbage and refuse are to be hauled to an incinerator and dumped onto barges at the water-front or at other plants, has been designed and is now for sale by George H. Holzbog & Brothers, Jeffersonville, Ind. For twenty years this company has been building round-bottom steel sanitary carts for the hauling of sewage, wet garbage, slops, night-soil, or anything of a liquid or semi-liquid nature. These vehicles are built with two or four wheels for two- or four-horse hauling. Following up their success in this line and at the request of numerous city officials, the manufacturers have devised this wagon, especially for the hauling of dry, light, bulky refuse, having an extra large capacity, a low-hanging bed, light weight and end dump.

The wagon illustrated herewith is built in 2-horse and 1-horse sizes, holding 5 and 3 cubic yards respectively. The body has hinged wings which are dropped down when heavy material is being hauled, or raised when light, bulky matter is carried. The dumping arrangement is such that one man can dump a whole load

without great effort. The height from the ground to the top of the bed on the smaller wagon is 48 inches, and on the two-horse wagon 58 inches, not including the extra drop wings. Each wagon has a sliding step or platform on which the loader may rest the barrel or box he is lifting into the wagon.

It has already been demonstrated that the larger wagon will haul the same amount with one crew of men and one team of horses as three of the ordinary dump-wagons with three teams and three sets of men. The actual saving, therefore, is sufficient to pay for a wagon in about sixty days. The wagons are built of high-grade material throughout, the wheels are of the Archibald iron hub pattern, claimed to be the strongest and most serviceable wheel made. The frame of the gear is of steel angles, giving long life to the wagon.

One of the schemes for the use of these wagons consists in making the house-to-house collection with the wagon drawn by horses, leaving it at a specified point where the horse pole can be readily shifted to a short trailer pole and then, by a truck or a tractor, hauling a string of the wagons to the point of disposal some distance away.

S. M. Williams Now with Autocar

S. M. Williams, Chairman of the Federal Highway Council, which has discontinued its highway activities, has become a special representative of the Autocar Company, Ardmore, Pa. Mr. Williams began his highway work with the organization of the Highway Industries Board during the war. Following the disbanding of the Board, he formed the Federal Highway Council, which in the last few years has been active in developing store-door delivery, studying sub-soils of highways, and supporting useful highway legislation.



ONE MAN CAN READILY DUMP THIS BODY

Fiscal Agents for Bond Payments

The United States Mortgage and Trust Company, 55 Cedar Street, New York City, has been appointed fiscal agent for the payment of principal and interest of bond issues aggregating \$2,273,500, including Durham, N. C., \$525,000; Memphis, Tenn., \$425,000; Ir ed ell County, N. C., \$400,000; and Winston-Salem, N. C., \$325,000. These and others aggregating \$13,281,600 are being prepared and certified as to genuineness by this company. They include: Jersey City, N. J., \$4,167,000; Harrisburg, Pa., \$800,000; Lenoir County, N. C., \$700,000; Wilmington, Del., \$697,000; and Milburn, N. J., \$298,000.



Saves 6 to 10 Men

UNLOADING cars, loading trucks, storing or reclaiming coal, ashes, sand or similar material.

This light-weight portable conveyor is a complete answer to conveying problems at thousands of plants and its first and operating cost is but a fraction of the cost of a more elaborate, but no more capable, conveying system.

Our catalog No. 46 shows how a great number of conveying problems have been met by this machine. May we send you a copy?

Portable Machinery Co.
Passaic, N. J.

The SCOOP CONVEYOR

A Sectional Grand Stand for Municipal Use

Celebrating the return of our soldiers in the early part of 1919, parades were held in every city of the country. These parades called for an enormous number of temporary grand stands, erected at great public expense only to be torn down later, with an almost total loss. They were often unsightly structures, and usually caused annoyance by blocking traffic for many days before and after their use.

Realizing that this was merely an aggravation of a permanent condition in all large cities, the Wayne Iron Works, Philadelphia, Pa., manufacturers of iron fence and other steel work, designed and patented a grand stand to overcome these defects, and the first complete stand was finished in the fall of 1919.

In principle this grand stand is like a sectional bookcase. The standard interchangeable sections are 42 inches long, 32 inches deep and 17 inches high. They each consist of four vertical members, connected by a triangular bracing, all of steel angles, hot-riveted at all connections. The gusset plates at the four corners are heavy steel hinges, which allow the sections to fold flat for storage. They cannot fold when in use, for each group of sections is supported by flanges which are diagonally braced from corner to corner. The sections dowel into the flanges and into each other, making lateral movement impossible.

The seat boards are 30 inches wide, and supported and stiffened by steel battens, which fit over the sections. Steel guard-rails for both back and sides, which fold for storage, complete the structure.

The sectional feature enables the stand to be made as long or as high as desired. It can be added to merely by purchasing additional sections.



THE "MAKINGS" OF A GRAND STAND

The stand is adaptable to any situation where it may be required. For parades it may be set up in as many tiers as the sidewalk width will permit, and the length may be varied to suit conditions. For football it can be used as a long, low stand, and it can be changed for baseball to short high stands. Narrow seats can be purchased for indoor use, where it is necessary to crowd many people into a small space. The sections can also be set up as a level platform for use as band-stand or stage. They can also be used for benches and tables.

Skilled labor is not needed to set up this grand stand; no tools are required in erection or removal. Not a bolt, screw, nail or pin is used. There are no small pieces to get lost.

The Wayne sectional grand stand is durable and economical. The sections being made entirely of steel, there is nothing to wear out. It can be erected and taken down as often as desired. Its erection makes no dirt, its appearance is neat, and its removal causes no waste or lost material.

The stand here illustrated, with a seating capacity of 1,000 persons, was erected in one working day by a foreman and eight unskilled laborers, and was removed by the same men in three hours. The two views show exactly the same material, folded and erected, illustrating the small storage space required.

This grand stand is absolutely safe and the design and construction have been approved by the Bureau of Building Inspection of Philadelphia. In use it has been loaded to double its rated capacity without the slightest risk.

Its use by the city of Philadelphia, the Bell Telephone Company, the Bureau of Recreation of Paterson, N. J., as well as many schools, both public and private, is evidence that it fills a long-felt need.



THE "MAKINGS" IN SERVICE

Lighting Standards

Caldwell and Drake Parkway and Boulevard Standards are First in

**QUALITY
DURABILITY
STABILITY
SAFETY
BEAUTY
PERMANENCE
ADAPTABILITY**

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SPECIFY STANDARD VITRIFIED PAVING BRICK.

THE FIRST INDUSTRY.



THE FIRST INDUSTRY.

Paving Brick

Leads the Way to Better Public Service

SECRETARY HOOVER urges all industry to clear its decks for better service by eliminating waste.

One essential element in this process is the elimination of needless styles and varieties of all products.

The Paving Brick industry, with the co-operation of the users of its product, is the first industry to meet the Government's request and present a comprehensive schedule which recommends the elimination of 55 needless varieties of paving brick, by "mutual consent" of manufacturers and users.

This keynote performance has set the pace for all other industries. The remarkable conference in Washington last November, and at which definite action was taken, was participated in by:

- | | |
|-------------------------------------------------------|------------------------------------------|
| American Association of State Highway Officials | American Society for Testing Materials |
| American Ceramic Society | Columbus (O.) Engineers' Club |
| American Electric Railway Engineering Association | Federated American Engineering Societies |
| American Engineering Council | Indiana Engineering Society |
| American Engineering Standards Committee | National Paving Brick Mfrs. Association |
| American Institute of Architects | U. S. Chamber of Commerce |
| American Institute of Mining and Metallurgical Engrs. | U. S. Bureau of Mines |
| American Society of Civil Engineers | U. S. Bureau of Public Roads |
| American Society for Municipal Improvements | U. S. Bureau of Standards |
| | U. S. Department of Commerce |
| | U. S. Army |
| | U. S. Navy |
| | Western Society of Engineers |

The 11 standards of this conference were ratified by the National Paving Brick Manufacturers and adopted as the Standards of this Association by formal action at Pittsburgh, Pennsylvania, December 7, 1921. They are as follows:

PLAIN WIRE-CUT BRICK (VERTICAL FIBRE LUGLESS)	WIRE-CUT LUG BRICK (DUNN)
Width Depth Length	Width Depth Length
3" x 4" x 8 1/2"	3 1/2" x 3" x 8 1/2"
3 1/2" x 4" x 8 1/2"	3 1/2" x 3 1/2" x 8 1/2"
3 1/2" x 4" x 8 1/2"	3 1/2" x 4" x 8 1/2"
REPPRESSED LUG BRICK	HILLSIDE LUG BRICK (DUNN)
Width Depth Length	Width Depth Length
3 1/2" x 3 1/2" x 8 1/2"	3 1/2" x 4" x 8 1/2"
3 1/2" x 4" x 8 1/2"	3 1/2" x 4" x 8 1/2"
VERTICAL FIBRE LUG BRICK	HILLSIDE LUG BRICK (REPPRESSED)
Width Depth Length	Width Depth Length
4" x 3" x 8 1/2"	3 1/2" x 4" x 8 1/2"
4" x 3 1/2" x 8 1/2"	

A COPY OF THESE PROCEEDINGS will be sent to you upon request and will bring you knowledge and understanding of rapid development up to date.

The burned-in service value of vitrified Paving Brick is matched by the aggressive Public Service spirit of the Paving Brick industry.

- Natl. PAVING BRICK Mfrs. Assn.**
 800 Engineers Building Cleveland, Ohio
- Eastern Paving Brick Manufacturers Association, Lincoln Building, Philadelphia, Pa.**
 Indiana Paving Brick Manufacturers Association, Fidelity Trust Bldg., Indianapolis, Ind.
- Illinois Paving Brick Manufacturers Association, Chamber of Commerce, Chicago, Ill.**
 Ohio Paving Brick Manufacturers Association, Hartman Building, Columbus, Ohio
- Southern Clay Manufacturing Company, Volunteer Building, Chattanooga, Tenn.**



AN AIRPLANE VIEW OF A PORTION OF ANDORRA NURSERIES

A Trip to Andorra Nurseries

Situated at the northern entrance of the far-famed Wissahickon Drive through Fairmount Park to Philadelphia, Andorra Nurseries are located in a rolling country offering a great variety of soils and exposures. With this great advantage of soils is coupled a range of temperature from the 20-below-zero days in the winter of 1917 to the hot, dry summers of this latitude, so that it is possible to grow hardy trees, evergreens and shrubs and to reasonably insure their success in every part of this country of varied climatic conditions to which their habits of growth fit them.

It is difficult to appreciate the extent of these nurseries, even when motoring by them or through them. The accompanying illustration, however, an airplane view showing the 300-acre Spring Mill Valley section of the nurseries, looking south, gives the reader some idea of their 1,100-acre tract on the direct highway between Philadelphia and Reading.

A Light-Weight Garbage Collection Truck

The Anthony Co., Inc., Streator, Ill., has developed a garbage dump body which has been found particularly valuable by a number of cities, such as Plymouth, Pa., St. Louis, Mo., Globe, Ariz., Thomasville, Ga., and Alexandria, La.

Plymouth, Pa., has two Anthony garbage dumps which have been in use for more than two years and St. Louis has a large number mounted on Ford trucks. The Anthony leak-proof solid steel garbage dump body on Ford trucks is an automatic dumping proposition. By touching the lever in the center of the driver's seat, the dump tips to a 50-per cent angle, opening automatically at the end gate and raising the top cover. The capital investment in these bodies and the trucks is much less than in a heavier type of truck and body.



... BODY FOR GARBAGE COLLECTION



Idle Cars and Men Mean Lost Profits

The Haiss Portable Belt Conveyor Keeps Them Working

Load your cars the instant they move up—The Haiss Portable Conveyor has a continuous capacity of 100 to 150 yards an hour at a cost of ½ cent per yard for power. It is portable—goes anywhere.

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THE GEO. HAISS MFG. CO., Inc.
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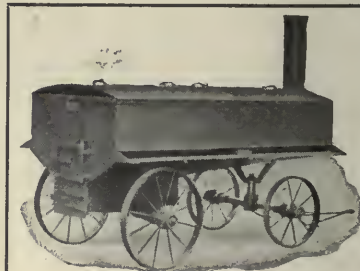
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C 1920 (Pat. PDG.)

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- 2—Type B—Bituminous Cellular Fibre Joint (75% Bitumen)
- 3—Type D—Cellular Fibre Joint (Solid edges and Sides, Self-Expanding)
- Type C—Sidewalk Joint ¼" a Specialty For Concrete Roads—Granite—Brick and Wood Block Paving—Buildings—Bridges—Walls and Reservoirs

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ERIE TANDEM PAVING ROLLERS

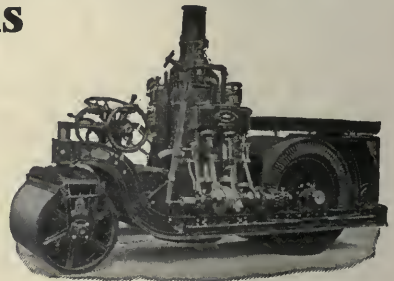
Includes everything that makes for the best in Road Rollers. They are strong, simple in construction—durable and economical and easy to operate. Our first roller built in 1887 is still doing its "bit."

Erie Rollers are guaranteed against breakage or wear for 5 years.

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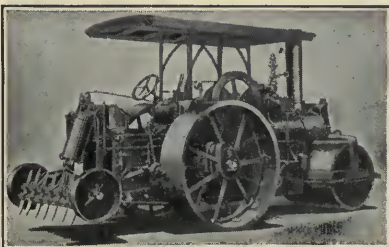
THE ERIE MACHINE SHOPS

ERIE, PA.



QUALITY MACHINERY

BUFFALO PITTS ROLLERS



With Pressure Cylinder Scarifier

Are purchased by Discriminating buyers due to the many years of satisfactory service which they will render, the low repair costs and their general reliability.

**ALL SIZES—ALL TYPES
STEAM AND MOTOR ROLLERS**

Users of Buffalo Pitts and Kelly Springfield Rollers should equip rollers with Pressure Cylinder Scarifiers.

Full information as to cost furnished on request.

THE BUFFALO-SPRINGFIELD ROLLER COMPANY
SPRINGFIELD, OHIO

Volume

XXVI

Number 2

The American City Magazine

New York

February

1922

Housing and Town Planning in Holland

By Stephen Child

Fellow, American Society of Landscape Architects

THE writer has spent some time in an effort to help forward reconstruction work in Belgium, and the trip into Holland herewith briefly outlined was a most interesting by-product of that effort.

The Dutch towns visited were Maestricht, Arnhem, Amsterdam, The Hague and Rotterdam, and in this order. At all of them, activity in housing and town-extension projects is marked, and everywhere there is an air of prosperity.

As one result of these favorable conditions, there have been built during the past few years by this nation of less than seven million people no less than 75,000 houses for working people alone. These have been constructed in 180 communities through the agency of some 1,250 different building societies, the work having been authorized under national guarantee and with the aid of state subsidies. Holland is hardly more prosperous than the United States, and if seven million people in Holland built 75,000 houses, America's one hundred million should have built a million houses during the same time. Or, to put it another way, the seven-million agglomeration included in Greater New York and its New Jersey neighbors should have built 75,000 houses, in which case there would probably not be a very great housing shortage.

Under the Dutch Housing Act of 1901, local authorities may make grants and loans to properly organized building societies, the money required being advanced by the National Exchequer, and the communities or societies being guaranteed the entire cost of construction, land and buildings as well as

streets and utilities. For fifty years the houses must not be sold or the rents altered without authority of the state. At the end of this period the buildings become the property of the city.

In Holland's Only Coal-Mining District

Of the various projects visited, none were more interesting, particularly from the town planner's point of view, than those in the vicinity of Maestricht, the capital of the Dutch province of Limburg. Here, near its suburb of Heerlen, are the only coal deposits in Holland. The mines have been in operation some fifteen years and were worked during the war with great intensity. We were told that many Belgians interned in Holland were set to work here, and as it is only five or six miles to the German line and not over fifty to either Dusseldorf or Cologne, one can readily see where much of the output may have gone.

As a result of the introduction of this coal-mining industry into a district that up to 1905 had been largely an agricultural one, the problem of housing for the workers became very serious. As an aid to its solution, there was founded a central or comprehensive society called "Ons Limburg," which has grown to include some 48 different building societies, each of which is given general guidance by the parent association. "Ons Limburg" has its Works Department and Technical Institute, which employs skilled architects, who prepare house plans for any of the affiliated organizations. Its staff of engineers is available to all. Experts install efficient bookkeeping systems,

and there is provision for inspection of completed work, often here and elsewhere by women who keep an eye on the moral as well as the physical conditions.

In order to prevent the mines from being surrounded by an unduly concentrated population, and to get the advantage of mixing to some extent the mine-workers with the country population—in a word, of securing most of the helpful influences of the English garden city idea, the building areas are dispersed over the country, partly on the borders of small towns or villages, partly forming separate groups of houses, and in some instances merging into one another.

In the different sites the number of cottages per acre varies from ten to sixteen. It was originally intended that there should be only separate houses or cottages, each for a single family, with an open space to each house, but this idea has not always been followed, for there are many row-houses. For the success of such a movement cheap land must be at the disposal of the building societies, and the solution of this problem in this rapidly growing industrial district was obtained by the assistance of a society called the "Tijdig," which buys on "due time" on a large scale the land while still at or near agricultural values, and hands it over at cost price to the local branches of "Ons Limburg" as soon as a building site is wanted. Some such method is quite generally employed in each community.

The Houses and Their Surroundings

While architectural details vary, most of the cottages throughout Holland have on the street floor a parlor, a living-room and a scullery, with the necessary conveniences, and on the second floor three bedrooms. There is usually not much of a cellar, and the houses are generally heated by stoves.

The topography about Heerlen is gently rolling, with some wooded hillsides, but mostly open farms. There has been considerable skill shown in fitting streets to topography, and where the land was nearly level, interesting adaptations of formal layouts have been adopted. Pavements and walks here as well as elsewhere in Holland are narrow, and the grassed, tree-shaded planting spaces are of ample width. Alleys are quite commonly employed, frequently merely footpaths not wide enough for teams. Interesting squares, plazas, formal gardens, and even quite good-sized informal parks, have been established. There are many single houses, more semi-detached, and a great many rows of from six to twelve houses. Brick is here, as throughout Holland, the favorite material, covered in some cases, for variety, with plaster.

Many of the houses are one and a half stories in height, and none over two and a half, except, as noted later, in Amsterdam. There is a pleasing variety in architectural types, although the rather heavy Dutch or German predominates. Gables, dormers and little towers are quite common. The grouping and set-back of the buildings, which varies with the topography, adds to the general appearance. Front dooryards are in general not over 15 to 20 feet deep.

The most noticeable feature of the houses, however, is the effective, not to say startling, result of the Dutch use of color. First, of course, all the roofs are red, or pinkish-red, tile, and most of the walls are dark red brick, but here and there this has been covered with a plaster tinted a bright yellow. More noticeable than this, however, is the



ALLEYS ARE OFTEN MERELY FOOTPATHS, NOT WIDE ENOUGH FOR TEAMS. REAR GARDENS ARE CAREFULLY PLANTED AND MAINTAINED



IN THE MORE LEVEL DISTRICTS, FORMAL PLANS OF LANDSCAPE GARDENING HAVE BEEN ADOPTED

painting of the woodwork: doors are frequently brown or green; shutters, yellow bordered with white, and sometimes decorated with lozenge-shaped panels of white, or even black or dark blue; window sashes and cornices are often a bright yellow ochre, sometimes green or brown.

Shade tree planting is quite general, native oaks being the favorite, with mountain ash a close second, one kind of tree to a street. Dooryards are frequently filled with flowering shrubs or herbaceous plants. Hedges and low, vine-covered walls separate the yards. The general effect is one of gaiety and brightness. Ample provision is made for churches, local shops and schools, with generous playgrounds.

The building societies frequently have their own large and well-equipped temporary wood-working shops for the fabrication of building material, but with characteristic Dutch thrift they all keep a sharp eye on prices elsewhere, and when these are found to be lower than the cost at their own shops, they do not hesitate an instant to shut down their shops and buy in the best market. There is apparently no community pride or political pressure to keep their own shops going; the one purpose is to secure houses rapidly, economically, and without raising rents.

Elsewhere in Holland

While in the Limburg district there is but one industry, coal mining, involved, at all the other cities visited the problem is the more general one of an acute housing shortage due to the rapid growth of thriving communities, and it is being met by similar methods in all of them, state and municipal-

ity cooperating with local building societies. The problem all through Holland is simplified by the fact that all are tenants—no one seems to want to own his home.

At Arnhem and elsewhere we found the term "complex" given to what we should call a garden suburb, a complete quarter or small district, each having its own individual character and particular type of architecture; at one, the "Blaudorp Complex," blue was the predominant color, while at the near-by "Roode-dorp" it was red. Here and at Rotterdam we found "complexes" especially designed for middle-class people. Except for slightly more spacious arrangements, that is, separate houses of eight rooms, these were in no way superior to the others as to construction details. The rents of these were originally but slightly above those of workmen's houses, but they have now been raised 50 to 75 per cent.

At Amsterdam the avowed purpose is to abolish the slum, here said to be as bad as, if not worse than, in any other city in the world. Land being relatively expensive and the soil generally marshy, requiring piles for foundations of most buildings, apartment or tenement houses, five stories in height, are the rule. The first of these, built a few years ago, are not attractive, but now more skilful architects are being employed with better results. On the outskirts of the city, too, row-houses are being built. A particularly interesting group is arranged for two families, one above the other, the second story flat having a separate doorway and stairway, and each having at the front, besides the entrance hall, a good-sized living-room with two windows or a

bay window giving on the street; at the rear in the center is a kitchenette with a small bedroom on either side of it, each with a window giving on the rear gardens, which here, as all through Holland, are well laid out, carefully and attractively planted and maintained, sometimes as play-places.

The population of Amsterdam in August, 1920, was 651,133, and a careful survey showed the need of fully 19,000 new houses; also that, allowing for the probable growth of the city, 6,800 new houses would be needed each year for a period of five years, or a total of 34,000. These the municipal authorities have set out to build, having plans ready now for 12,000, over 4,000 of which are nearly if not quite completed. From 1905 to January 1, 1920, 108,000,000 florins has been appropriated by the state and city for Amsterdam housing.

At both The Hague and Rotterdam, land being relatively cheaper, there are no buildings over two and a half stories in height, many but one and a half, and while there are a few semi-detached houses, most are in rows of from six to a dozen. Here, too, brick is the favorite material, and there is a perfect riot of color for the woodwork. At Rotterdam 3,000 workmen's houses are under way or completed.

The building-cost of the Dutch cottage described above—the cost of land and the making of streets excluded—averaged up to the year 1915 about 175 pounds, but has now increased to from 400 to 480 pounds. The cottages erected before the war were let at a rent of about 5 shillings per week, which, we were told, provided a full commercial return on the capital outlay. The increment of the building-cost makes it impossible to continue in that way, and at present the

rents, fixed at about 8 shillings per week, produce only 50 to 60 per cent of the sum required for interest, repayment of loans, and working expenses; the rest is granted annually as a subsidy by the state and the communities interested, being absorbed without serious opposition by general taxation, a form of government philanthropy not relished in America. In no case do the rates charged meet the standard of "economic rent" that should be received, and there must come here in Holland some time in the future a day of reckoning; a writing-off of inflation and a genuine return to a true economic basis; one that will make the worker more independent because not, as now, a recipient of government philanthropy.

Indirectly, perhaps, Holland is to be aided in this particular by its foresight in proceeding as it has very generally done, to purchase large areas of land in the vicinity of most of the growing cities, and holding these at cost for the building of workmen's homes. The city of Arnhem now owns over 4,000 acres of such land, and The Hague 3,000 acres, which is held in reserve for this purpose; bought, in most instances, at or near agricultural values and held under agreements permitting the cultivation and sale of crops until needed for building. The community will therefore profit by the "unearned increment," and, what is more, when the need arises there will be none of the unfortunate delays that come through the slow process of expropriation.

EDITORIAL NOTE.—This article is compiled from data collected on a journey through Holland and Belgium in the year 1920. The writer has just returned from another visit to Holland and finds a continuation of activity along the lines described in this article. There seems to be very little diminution in the house-building program of the Netherlands.

Does Your City Encourage Panhandlers?

Street begging, says The New York *Times*, "is an abuse and an evil, and those who distribute 'charity' in this form should know that they simply are encouraging professional mendicancy."

Two members of the Salvation Army, Major Edward Underwood and Roy P. Gates of the Joint Application Bureau, recently tested this matter in New York City by going out and doing some panhandling themselves. The only disguise they used was to turn up their collars and not to wear

overcoats, but within an hour they had collected dimes and quarters to the extent of \$3.35, and realized that the business was a profitable one if they chose to follow it.

They usually asked for jobs when they made their demands, but nobody took that seriously or made any inquiries. Instead, the coins were passed over "with as little thought as one would give in patting a stray dog."

Talks with other men engaged in begging showed that about twenty-four in twenty-five were professionals.



VIEW OF ARKANSAS CITY, KANS., RESERVOIR, SHOWING TENNIS COURTS

New Circular Reservoir at Arkansas City, Kansas

Construction Features the Use of Slip Forms—Tennis and Volley-Ball on Roof

By C. A. Smith

Burns & McDonnell, Kansas City, Mo.

THE two-million-gallon reinforced concrete reservoir recently completed at Arkansas City, Kans., has some interesting features of design and construction methods, and also novel uses since its completion. The reservoir was constructed to provide a reserve and equalizing storage between the supply wells and the high-service pumps located approximately $1\frac{1}{4}$ miles from the site of the well system.

The site available for the reservoir was a low tract of ground adjacent to the pump station, owned by the city for park and playground purposes, but had never been improved. It had been used as a dump ground and was partially filled with old refuse, brick, tin cans, street sweepings and rubbish. The results of the preliminary test borings indicated approximately an average of 8 feet of old fill and original loam and 2 feet of water-bearing sand overlying a solid limestone stratum. The reservoir was designed to use this rock stratum as the floor. Upon removing the top soil, the rock surface was found to be fairly smooth and level, having a grade or dip of approximately 0.8 of 1 per cent. Several faults or cracks from $\frac{1}{4}$ to 1 inch wide, averaging about 20 feet apart and running at right angles to each other, were cleaned out and grouted full of 1:2 cement mortar, and after chipping off some of the irregular or un-

even places the entire rock surface was washed with a cement grouting, making a satisfactory bottom or floor.

The reservoir is 156 feet inside diameter and 14 feet deep below the overflow weir. The design is of the ring tension type with walls resting on a subfooting keyed into the rock stratum forming the bottom. The wall is separated from the footing by a specially designed expansion joint, in order to eliminate cantilever stresses. The roof is a 5-inch reinforced concrete slab carried by 10 x 15-inch beams spaced 12 feet on centers each way and supported by 10 x 10-inch columns. The roof was given an 8-inch slope from center to wall, and the top was given a floor or sidewalk smooth trowel or float finish.

The wall was originally designed tapering from bottom to top, but was changed to a uniform thickness in order to use slip forms. The ring tension steel was placed in two rows and held firmly in proper place by vertical standards spaced 6 feet on centers, made of 3-inch channels with notched strap steel bars riveted at the proper intervals.

The wall forms were made of 1-inch ship-lap in sections 12 feet long and 4 feet in height. After receiving a coat of paint they were assembled and centered in place. The forms were filled within 6 inches of the top and then were raised slowly by means

of the ordinary slip form jacks operating on 1-inch jack-rods, which were cut off at the top of the wall when the pouring of the wall was complete. Two men were employed to operate the jacks, making a complete circuit twice an hour and raising the form approximately 1 inch each time.

The concrete was run continuously in the walls, using two mixers located in opposite sides and alternating from one mixer to the other every hour. There were three 8-hour shifts of men consisting of 10 laborers and foreman mixing and placing concrete, 3 men placing and wiring steel, 2 men operating form jacks, and 2 carpenters shifting runways and miscellaneous work. The total time required for the wall was 80 hours. The concrete was conveyed from mixers to wall in wheelbarrows on board runs.

The use of the slip forms with the concrete deposited continuously in small layers allowed the concrete to be well puddled, and when the wall was finished no construction joints, voids or pockets were visible and the finish was very smooth. The walls showed no sign of seepage when the reservoir was filled.

The column footings were keyed into the rock stratum, and the tops carefully graded from center to outside wall to conform to

the roof slope, so that all column forms were of the same length, thus simplifying the construction and placing of forms.

Tennis Courts on the Roof

The location of the reservoir being on park property, it was decided before completion to utilize the top for tennis and volley-ball courts. The manhole openings and ventilators were so placed that ample space was provided for two tennis courts. Pipe couplings or sockets were installed in the roof slab for the net posts, and also sockets around the wall for posts for fencing the entire area. The accompanying illustration shows two tennis games in progress, and the courts are very popular.

The main items in the construction were 7,162 cubic yards of earth excavation, 1,038 cubic yards of concrete, 71.7 tons reinforcing steel and 4.2 tons channel iron and miscellaneous. The total cost of the completed reservoir was \$52,887.21. The reservoir was designed by Burns & McDonnell Engineering Company, of Kansas City, Mo., and constructed by Ray & Son, contractors, of Baxter Springs, Kans., and the work was supervised by Charles W. Lusk, City Engineer of Arkansas City, Kans.



CONSTRUCTING RESERVOIR WALL, USING THE SLIP FORM METHOD

Proper Waste Disposal in Relation to the Fly and Disease

By W. Dwight Pierce, Ph. D.
Consulting Entomologist, San Mateo, Calif.

IT is doubtful whether even our highly civilized American public has ever had brought home to it the fulness of individual and municipal responsibility in the matter of waste disposal to prevent transmission of disease by the fly and other insects.

It would require a good-sized volume to give a digest of the evidence proving how flies and other insects carry disease germs from waste to our foods, and to discuss the essential points in their life history and control, and then to fully discuss the ways and means of waste disposal. The writer must

COMMONWEALTH OF PENNSYLVANIA
· DEPARTMENT OF HEALTH ·

MAKE THE WAY HARD FOR THE FLY AND EASY FOR THE BABY

The Lucky Mme Fly leaves her Birthplace

She gratifies her inherited tastes

She stops to poison a Baby

She Rejoices at the open window

She gloats over one of her Victims.

The Last Act of Nature - Deposits her Eggs in the Manure Heap

FLY WINS - BABY LOSES

BABY WINS - FLY LOSES

Flies breed in filth
Destroy their breeding places
Do not grow flies for your neighbor
Destroy their breeding places
Do not allow your neighbor to grow flies for you.
Destroy their breeding places
Ninety percent of all flies are bred in the manure of horses
Destroy their breeding places.

Diet Level

The Unlucky Mme Fly starts out in Life

but meets early disappointment

FOILED AGAIN

Balked!!!

The Trap

Clean Stable-yard; Eggs will Perish

J.F. Muller

therefore content himself with a concise statement of facts, in the hope that he may lead those who read it to a more intelligent fight against disease, through the means of proper waste disposal.

That which must be made clear above all else is that every citizen has here a grave responsibility, and that practically all epidemics of insect-spread diseases can be directly traced to the carelessness of individuals, if not of the community at large. If you could realize that the presence of diarrhea, dysentery or typhoid in your family may be directly due to your own or your neighbors' carelessness, would you remain listless and inactive? If you saw your dear ones sick and dying and knew that others were in the same danger, would you try to run down the cause and put a stop to it? If you would not, you have become so calloused that you are measurably more responsible for the calamity. The matters with which this article deals are unquestionably matters of public welfare and responsibility, but this does not by one iota diminish the individual responsibility.

Why Waste Disposal Is Essential

Let us try to assimilate some of the essential facts before touching directly upon waste disposal.

1. Communicable diseases have a causative organism.
2. The causative organisms of all intestinal diseases, at least, will be voided in human or animal waste.
3. Waste matter of all kinds, but especially human and animal waste, is especially attractive to insects and is the source of the majority of flies found about human habitations.
4. Fly larvae breeding in waste take into their bodies whatever organisms are present, and in many cases harbor these organisms uninjured in their bodies, until they have matured into full-grown flies, and for some time thereafter.
5. Adult flies alighting on waste take up as food disease-organisms, and also pick up many on their feet.
6. The flies which breed in and frequent filth also frequent dairies, groceries, meat markets, kitchens and dining-rooms, and invariably deposit on whatever they alight upon, a speck of excrement containing disease organisms, as well as losing some of the filth from their feet.
7. Disease organisms can live in flies for many days.
8. Flies can fly many miles.
9. A single case of typhoid fever, dysentery or diarrhea in the country or city where open privies prevail, will in due time give rise to a myriad of flies spreading over the countryside and each carrying disease germs. And if there is a dairy barn within their zone of flight, they will find it and be irresistibly drawn to the

milk. One of these touching the milk may leave a culture of organisms which will be distributed to every customer. We often trace the disease to the dairy, but we sometimes fail to go on to the place where the flies got the germs.

10. Some of the disease-laden flies may stop at a manure pile and lay eggs, but with these eggs will be the germs. The fly larvae will take these germs up, and, as mature flies, will, a few days later, carry them on. The same thing may happen in a garbage pail.

11. Any substance in which flies breed is dangerous, because the more flies we have, the greater the danger of their picking up disease organisms. Therefore, we must watch garbage, factory waste, sewage, manure, and all other kinds of decaying matter. It is not always that the large mass of waste is the most dangerous. The little things must receive attention as well as the big.

Problems of Waste Disposal

What, then, are the problems of waste disposal? They are not confined to the city itself. They are not always easy to discover or handle. They concern the personal habits of the entire population. They are found wherever food is found.

I. The city sanitarian must watch the city milk supply to its ultimate source. He must be constantly in touch with the health situation in all the surrounding territory.

II. The sewage disposal of the whole countryside has a direct bearing on the health of the city inhabitants.

III. Wherever the open privy exists is to be found a menace to the health of all the people for many miles around.

IV. Every manure pile is a source of millions of disease carriers.

V. The moist manure-laden refuse in the gutters and cesspools gives rise to flies.

VI. Every garbage pail is a focus for flies. Free municipal garbage removal is a necessity to insure uniform and regular removal.

VII. Every barn, livery stable, pig-pen, chicken-yard and dove-cote is a potential source of flies.

VIII. Packing-houses, canneries, breweries, and many other industrial plants create great quantities of waste in which insects breed.

The problem of waste disposal is so to dispose of all kinds of waste as to prevent fly-breeding and at the same time conserve whatever values are inherent in the waste in such manner as to defray a large part of the costs of waste collection by converting the waste into materials of commercial value.

Sewage sludge treated in a disposal plant may become good fertilizer material. Manure dried and pulverized is a valuable fertilizer and no longer attractive to flies. Garbage may be converted in a disposal plant into fats, glycerines and other products of considerable value.

The Direct Oxidation Process of Sewage Treatment

A Small Plant at Phillipsburg, N. J., and a Large Installation at Allentown, Pa.,
Are Now in Operation

THE functions of the direct oxidation process are based upon electrolysis of the sewage, which previously has been made slightly but definitely caustic by the addition of lime. By means of such electrolytic action the production of nascent hydrogen and oxygen almost instantly effects a definite stabilization of the unstable organic matter contained in the sewage and thus renders it inoffensive. By the same means, pathogenic bacteria, if such are

of 16,923. It supports 22 industries, of which 7 produce iron and steel products, and 12 engage in the manufacturing and dyeing of silk fabrics. The city sewage contains a preponderance of industrial wastes consisting of soaps, oil-emulsions, dyestuffs, and extracts from the silk industries, together with pickling liquors and mineral oil from the iron industries. With the exception of a small area, the sewage is conducted to the treatment plant by gravity,



EXTERIOR OF THE PHILLIPSBURG, N. J., SEWAGE WORKS

present in the sewage, as may at any time be the case, are destroyed. This process, as its name implies, is "direct." Unlike all other sewage treatment processes, including the activated sludge process, it does not depend for its success upon bacterial activities. In this cardinal respect, therefore, it differs diametrically from all other types of sewage treatment works. It is a mechanism depending only upon the uninterrupted addition of lime in proper quantity to the sewage, and a continuous flow of electric current to the electrolyzers.

At Phillipsburg, N. J., is located a typical plant of this type. Phillipsburg is essentially an industrial city, having a 1920 population

through sanitary sewers which eliminate storm and surface waters.

The sewage treatment plant is located on Saw Mill Road some 230 feet south of South Main Street. A number of first-class residences are located on adjoining property. The plant site proper is an irregular tract covering an area of $1\frac{1}{4}$ acres, of which the complete plant occupies but $\frac{1}{3}$ -acre. In the treatment plant, which has a rated capacity of three million gallons per day, the sewage flows throughout by gravity, first passing through either or both of the flat plate screens, under which grit chambers are located. These screens have $\frac{1}{4}$ -inch perforations and are cleaned by me-

chanically operating brushes. In conjunction with the grit chambers, the screens are designed to protect the electrolyzers by removing the coarser suspended matters and abrasive substances or grit.

From the grit chambers the sewage passes through any or all three of the electrolyzers, each of which has a treating capacity of 700 gallons per minute. Each electrolyzer consists of a horizontal cypress tank 27 feet long and 3 feet by 3 feet in cross-section. The tank is divided into two sections, each having a removable lid for accessibility to the interior, which contains two rows of electrodes of eleven banks each, mounted one above the other, making twenty-two banks in all. Each bank of electrodes contains 48 mild steel electrodes 10 inches by 16 inches by 3/16-inch spaced 3/8-inch apart, and so connected electrically that alternate plates have the same polarity. In each bank between the plates two Bakelite paddles are revolved by means of a line shaft and reducing gearing mounted upon the outside of the tank, their function being to act as mechanical depolarizers and to keep the passage between the electrodes free from accretions.

Electrically, the 22 banks of electrodes are connected in simple series, so that the current employed is utilized 22 times at the expense of the impressed voltage. To express in simple form the action produced in each electrolyzer, it may be said that it is equivalent to that resulting from passing the sewage in a sheet 3/8-inch thick between electrodes 30 feet square, agitating it during its passage with 2,068 paddles and using a current strength 22 times as great as is impressed upon the physical apparatus. From this there is every good reason to believe that all of the sewage is subject to the action of the nascent oxygen produced upon the electrodes.

Upon leaving the electrolyzers, the sewage flows through a sedimentation basin, which is divided into two sections, each of which is 28 feet by 100 feet and 2 1/2 feet in depth, and has a flat slope on the bottom of 1/8-inch per foot to the sludge outlet. The effluent of the sedimentation basin is discharged into Lopatcong Creek, which affords a dry weather dilution of about 4 to 1.

The sludge from the sedimentation basins is discharged upon a sludge bed 50 feet by 50 feet in area, composed of graded stone and sand, and underdrained. The liquid

drained from the sludge is discharged direct into the creek.

The plant is operated by alternating current (220-volt, 3-phase, 60-cycle); the direct current used for the electrolysis of the sewage, and averaging 66 volts and 34 amperes for each electrolyzer, is obtained from independent motor generator sets. The entire control is mounted upon panel boards on the operating platform.

In addition to the electrical equipment, there is also provided a compact lime storage pulverizing and dosing equipment, by means of which run-of-kiln lime is reduced to powder passing a 100-mesh sieve. The dosing device is adjustable and feeds the pulverized lime into a slaking chamber, where it mixes with either screened or treated sewage or with city water, and is conveyed to the inlet end of the electrolyzers in such amounts as will consistently render the sewage slightly caustic.

Daily operating charts have been prepared since October 18, 1920, showing that:

(a) The sewage flow peak has mounted gradually until at the present time, with 75 per cent of the house sewers connected, it amounts to 2,000,000 gallons daily.

(b) The total power consumption averages 150 kw. hours per million gallons.

(c) Lime, containing 80 per cent CaO, is applied at the rate of 1,100 pounds per million gallons. It has been found that lime containing 94 per cent CaO can be had for the same price, which would reduce the amount consumed to 950 pounds per million gallons.

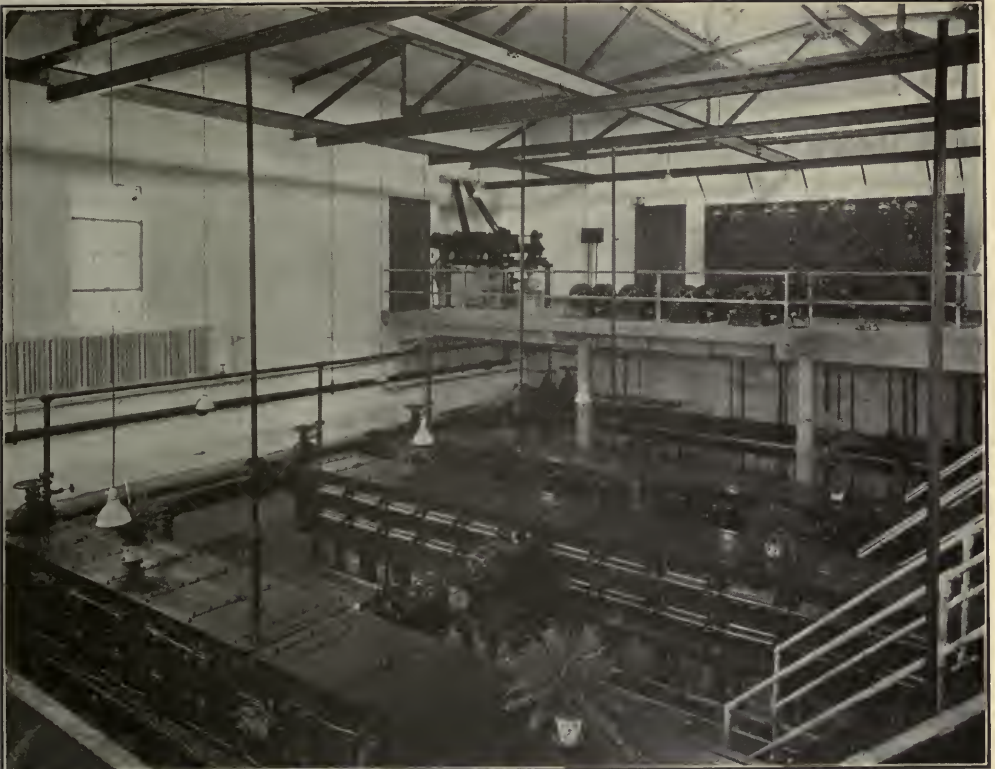
(d) Each section of the sedimentation basin is blown down twice a month and the sludge discharged into the sludge beds, where, after remaining for three days, it is removed and spread on the near-by fill. The dry sludge amounts to approximately 400 cubic feet per week and requires the services of two laborers for two days to remove and spread it.

(e) Three operators are employed, working on eight-hour shifts at salaries aggregating a total of \$4,500 per year.

(f) The entire first cost of the disposal plant, including land, etc., was \$173,845.49, or \$57,950 per million gallons daily capacity.

With the plant operating at full capacity (3,000,000 gallons daily), a conservative estimate of the cost of treatment, including the handling of sludge, is as follows:

	Per Day
Capital charges (8 1/2% on \$173,845.49) for interest, sinking fund and depreciation.....	\$40.50
Power, 450 kw. hr. @ \$.03.....	13.50
Lime, 1.5 tons @ \$10.57.....	15.86
Heat, light and water.....	1.93
Salaries, \$4,500 per year.....	12.33
Placing sludge, \$0.50 per hour, 2 laborers 2 days per week (average).....	2.30
Incidentals	1.05
Total	\$87.47



Courtesy H. F. Bascom, City Engineer, Allentown, Pa.

THE INTERIOR OF THE DIRECT OXIDATION PLANT FOR THE TREATMENT OF SEWAGE, ALLENTOWN, PA.

The cost of treatment per million gallons will, therefore, be \$29.16, which is equivalent to \$1.24 per capita annually, of which \$0.57 is for fixed charges and \$0.67 for operating cost.

The plant has been in operation for practically a year, and from all the evidence at hand has consistently produced a non-putrescible effluent and a stable sludge. During this period the sludge has been used in

grading the site about the plant, and from present indications will be utilized in this manner for the next six years. Absence of nuisance is evidenced by the lack of complaints from the near-by residences. A similar, though much larger, plant of the same type is now in operation at Allentown, Pa.

ACKNOWLEDGMENT.—From a report on The Treatment of Municipal Sewage made to the Board of Public Works of East Chicago, Ind., by George A. Johnson, New York City.

City Planning in Massachusetts

The report of the Massachusetts Division of Housing and Town Planning for 1920, recently published, contains a summary of the reports of the thirty-six planning boards of the state. No less than 15 cities have taken up zoning, and at least two more took it up in 1921. Seventeen boards organized under the mandatory law had not resumed

activity since the war, though four of these have done so since the period covered by the report. Thirteen places have not yet complied with the law by establishing boards. The Commissioner of the State Department of Public Welfare, Richard K. Conant, has asked for an appropriation to provide for a field secretary of town planning in 1922.

“Ye Olde Towne Meeting” Up to Date

By E. F. Ayres

Secretary, Idaho Chapter, American Association of Engineers

THE old-time New England town meeting was one of the most perfect systems of government ever devised. Each citizen, rich or poor, had an equal opportunity to express his opinions and fight for his ideals. He of the silver tongue had to present something besides superheated generalities if he wanted to put anything across. The crowd knew him personally, so his appeal to the stars above and to the old flag flying in the heavens failed to move his audience. At least, it failed to move their purse-strings.

Just as soon as the little settlements grew too large to admit all citizens into one hall, the town meeting was abandoned in favor of representative government. The individual lost his opportunity to make himself a factor in the administration of his community.

Boise, Idaho, has developed a plan which seems to combine the advantages of the old town meeting with the best features of representative government. It has organized a Community Council. Other cities are trying the same experiment, some of them having started before Boise thought of it.

It requires no long campaign, no costly publicity, to start a Community Council. In Boise, a few public-spirited citizens sent a notice to every organization in the city, asking that a delegate be sent to a meeting to be held at the Chamber of Commerce. Every church—Roman Catholic, Protestant, Mormon, Adventist, Christian Scientist and Hebrew—every fraternal organization, every labor union, every women's club, every parent-teacher's circle, every association of professional men and women, and every racial group—was invited to send a representative. No one imagined that over 50 invitations would be required. There proved to be an even 190, and of these, 127 were represented at the first meeting.

After a discussion of the problems most vitally affecting Boise's future, a short, concise constitution and by-laws were unanimously adopted.

A Planning and Advisory Body

Unlike the old town meeting, the Council

has no legislative powers. In fact, it has no powers of any kind in itself. It can only plan and advise, any action being taken through its constituent organizations. It cannot raise funds, nor spend them, nor can it be used to put across any of the innumerable drives with which we have been pestered since the war revealed the large amount of loose cash in the pockets of the American people. The Council serves as a clearing-house for ideas, and each delegate, whether representing two thousand or only twenty members of his association, has an equal voice in the decisions of the central body.

The Community Council gives to each citizen a closer touch with public affairs. He is represented through his lodge, his church, his union, or his club. If he is a “joiner” he is represented many times. All matters of importance must be referred to him for final action, and he will work a great deal harder, and with a better spirit, for his pet enterprise when he knows that his neighbor is working shoulder to shoulder with him through another organization. Racial and creedal differences can be ironed out before they gain dangerous headway, for when representatives from both sides meet on a common ground, presenting their own views and having the opportunity to see the other fellow's view-point, antagonisms melt away in mutual understanding.

Boise needs playgrounds for her children. She needs a system of municipal garbage collection. She needs zoning regulations. She needs a large hall for public gatherings. This year the High School had to hold its graduation exercises in a theater, as there was no public hall large enough to accommodate the parents and friends of the Senior class. Now that the Community Council is under way, Boise stands a good chance to get these improvements and many more in addition. Single organizations, or lone individuals, lacked the strength to get things started. The Council will outline practical programs and then get out and hustle, through its member associations, to put the programs into effect.

Philadelphia's Service Test Road

Cost Data from the Final Report of the Byberry and Bensalem Road Pavement

BECAUSE the extension of Bensalem Avenue, Philadelphia, would involve the removal of a portion of the well-known Byberry and Bensalem Service Test Road, the Philadelphia Bureau of Highways has issued a very interesting final report on this road, which was constructed in 1912-1913. To aid in the proper appreciation of the data regarding the general conditions of the road and the cost of repairs, as well as the proper interpretation of the data for the numerous types of pavements laid, the final report gives a general statement of conditions which affected the behavior of the road, both as a whole and also as to the individual sections.

The principal elements which affected the required amount of maintenance work as compared to what might have been antici-

pated from the usual wear and tear under most favorable circumstances, were:

1. The change in traffic conditions which occurred since the construction of the road in 1912-1913
2. The difference in foundation and drainage conditions existing between the several sections.

At the time this improvement was made it was recognized that the Service Test Road was to be a part of the main traffic route between New York and Philadelphia, but not until the reconstruction in 1915 of the adjacent section of state highway did the Service Test Road actually begin to serve this purpose. The general increase in motor truck traffic on roads subsequent to 1913, and more particularly the enormous increase which occurred on certain roads during the period of the war, is a matter of



TWO VIEWS OF THE BYBERRY-BENSALEM ROAD, LOWER VIEW SHOWING BRICK PAVING ON HILLSIDE

FINAL REPORT, COST AND EXTENT OF REPAIRS, BYBERRY AND BENSLEM SERVICE TEST ROAD—
1913-1920

Section No.	Station to station	Number of square yards	Type	Total cost, maintenance	Total square yards repaired	Average annual maintenance cost per square yard entire pavement	Ratio area repaired to original section area
1	0+00 to 37+00	6,578.0	Bituminous concrete, Amiesite. . . .	\$9,370.32	11 139.5	\$0.178	1.68
2	37+00 to 47+00	1,788.0	Bituminous concrete, Topeka.	1,237.59	1,487.0	.087	.83
3	47+00 to 50+00	533.3	5" concrete pavement with bituminous carpet (a).	1,035.24	1,715.6	.243	3.22
4	50+00 to 52+50	444.0	Vitrified block pavement on 4" concrete base.	29.16	16.0	.0082	.036
5	52+50 to 59+50	1,244.0	5" concrete pavement with bituminous carpet (b).	2,990.88	3,549.1	.301	2.85
6	59+50 to 72+00	2,222.0	Bituminous concrete, Filbertine. . . .	1,944.72	1,871.	.109	.84
7	72+00 to 84+50	2,222.0	Bituminous concrete, District of Columbia specifications.	1,062.07	1,391.	.060	.63
8	84+50 to 87+50	533.0	Vitrified block pavement on 4" concrete base.				
9	87+50 to 94+00	2,933.0	5" concrete pavement, with and without bituminous carpet (a). . . .	3,159.10	3,234.	.135	1.10
10	94+00 to 97+00	533.0	Vitrified block pavement on 4" concrete base.	69.55	160.	.0163	.30
11	97+00 to 103+00	1,067.0	Bituminous concrete, open mixture	180.00	188.	.021	.18
12	103+00 to 109+00	1,067.0	Bituminous concrete, gravel aggregate.	536.69	359.	.063	.34
13	109+00 to 112+50	622.0	Vitrified block pavement on 4" concrete base.	101.83	163.	.205	.26
14	112+50 to 118+00	978.0	5" Hassam concrete pavement with bituminous carpet (b).	1,951.32	2,303.1	.249	2.36
15	118+00 to 121+00	533.0	Vitrified block pavement on 4" concrete base.	68.70	89.	.016	.17
16	121+00 to 127+00	1,067.0	Bituminous macadam, Ugite binder	335.22	1,516.	.0393	1.42
17	127+00 to 130+00	640.0	Bituminous macadam, originally Byerlite binder, reconstructed in 1914, Tarvia "X" binder.		640.		1.00
18	130+60 to 133+00	427.0	Vitrified block pavement on 4" concrete base.				
19	133+00 to 139+00	1,067.0	Bituminous macadam, Tarvia "X" binder.	421.07	1,698.8	.049	1.59
20	139+00 to 145+00	1,067.0	Bituminous macadam, Texaco asphalt binder.	1,154.09	2,964.9	.135	2.78
21	145+00 to 151+00	1,067.0	Bituminous macadam, Standard asphalt binder B.	1,420.70	3,017.8	.166	2.83
22	151+00 to 157+00	1,067.0	Bituminous macadam, Pioneer road asphalt.	522.54	1,586.	.061	1.49
23	157+00 to 163+00	1,067.0	Bituminous macadam Bermudez asphalt binder.	472.87	2,566.4	.055	2.41
24	163+00 to 169+00	1,067.0	Bituminous macadam, Sun Hydralene binder.	94.16	1,355.4	.011	1.27
25	169+00 to 174+50	978.0	Bicomac—Concrete pavement.	243.77	593.	.031	.61
26	174+50 to 180+15	1,004.0	Vitrified block pavement on 4" concrete base.				

(a) Partially resurfaced with asphalt pavement, 1916 and 1918.

(b) Completely resurfaced with asphalt pavement, 1918.

common knowledge. The Service Test Road was, as a matter of fact, obliged to carry practically all of the heavy commercial traffic between New York and Philadelphia during this period, in addition to the countless trains of Government trucks which were moving between these two cities—a sum total which in weight and intensity was sufficient to constitute a severe test of the durability of the most substantially constructed city street. It is obvious that at the time of construction it was impossible to foresee a traffic condition of this sort. The 16-foot-wide improved surface was not adequate for the number of vehicles using the road, and the breaking down of the edges, especially of bituminous mixtures on macadam base, was undoubtedly greatly aggravated by the narrow width of pavement.

Foundations and Drainage Conditions

Nearly all of the new road was placed on existing macadam, strengthened by the addition of new stone, unless concrete was to be laid. The condition of the old road varied considerably before reconstruction, some stretches showing the effect of very poor natural drainage; Section 1, and almost the entire portion on which the eight bituminous macadam sections were placed, lie in a flat and heavy clay soil in which it is almost impossible to obtain natural drainage. The heavy repairs which were necessary on these sections could in nearly every case be traced to the failure of the foundation resulting from the unsatisfactory drainage conditions referred to.

In contrast to this situation, the sections of vitrified brick pavements were placed on

grades with the intent of affording a better foothold, and in consequence were in general located in sections where the natural drainage was better than the average of conditions on the whole road. These sections had the additional advantage of a 4-inch Portland cement concrete foundation laid on the existing macadam, thus producing a degree of support for the brick surface much superior probably to that of any other sections. In the light of these conditions the brick pavement work as a whole must be regarded as much more substantial construction than that used in other portions of the road, and the subsequent condition of the brick sections is correspondingly superior to that of the other pavements.

Sections 3, 5 and 14, built of 5-inch concrete pavement, were resurfaced in 1918 with 1-inch binder and 1½-inch asphalt wearing surface. That portion of Section 9 consisting of 5-inch concrete pavement which was resurfaced in 1916 with 1-inch asphalt binders and 1-inch asphaltic wearing surface, and Section 25 of Bicomac pavement on 4-inch Portland cement concrete foundation, are now also in good condition.

On sections of road other than those specifically mentioned, the accompanying table shows costs and extent of repairs up to and including 1920 and furnishes a general index of their behavior during their period of service, as well as of their general condition at the present time. During the spring thaw of 1920 severe damage was done to the road by truck traffic, which necessitated many repairs and a general

bituminous surface treatment of practically the entire road, with the exception of those sections previously mentioned.

General Conclusions

Accurate comparisons between the serviceability and cost of the various materials and types of construction are virtually impossible because of the disturbing factors previously described, but certain general points are nevertheless brought out by the experience of this road:

1. The degree of success obtained with pavements having macadam foundations is apt to vary directly with the extent to which a dry subgrade condition can be preserved, other conditions being equal. Pavements having Portland cement concrete foundations are less susceptible to failure from this cause.

2. Relatively lean concrete mixes are unsuitable for direct exposure to traffic. Thin bituminous carpets placed on concrete foundations, while varying considerably in lasting qualities according to the character of the bituminous material, are not to be considered as durable surfaces for use by heavy traffic. Mixed bituminous pavements afford a very much greater degree of protection to concrete foundations.

3. Differences between character of bituminous materials or composition of bituminous mixtures, although of considerable importance when the other conditions of use are nearly ideal, become of secondary importance when foundation, drainage and other related conditions enter into the comparison.

More Intelligent Highway Building

Fifty years ago the paving and maintenance of the highways in many cities frequently were in charge of men unskilled and selected by political preferment. Now, due largely to the activities of civic and business organizations interested in street betterments, and also to the advancement in municipal administration, work of this kind is usually entrusted to trained engineers familiar with municipal affairs.

The development and increase of motor traffic in cities has led to an improvement in its pavements to meet this demand. Materials heretofore found to be satisfactory have proven to be inadequate, and this has necessitated the development of road sur-

faces which will give maximum wear with a minimum cost of construction and maintenance. Laboratories have been established for research and to provide means for determining the properties of materials. Comprehensive specifications are now drawn in which the materials to be used are definitely described and the methods of tests to insure such materials are clearly set forth. This enables the city to obtain proper construction of its street surfaces and to effect great economies, due to the fuller and freer competition of bidders and greater permanency of the work.—“Municipal Engineering,” George S. Webster. Trans. Am. Soc. C. E. 1921, page 516.

The Topographic Survey and Its Relation to City Engineering Work

By J. R. Pollock

Sanitary Engineer, City Engineering Department, Flint, Mich.

THE growth of Flint, Mich., has been abnormal during the past ten years, increasing from 38,550 in 1910 to over 100,000 in 1920. This rapid increase in population has caused an urgent need for public improvements and has made acute some already pressing engineering problems. During 1920 a program requiring the expenditure of more than \$2,215,000 was carried out by the City Engineering Department, less than 10 per cent of the work being done by contract. This program included 32 miles of sewers, 7 miles of street paving, 15 miles of sidewalk paving, two bridges, a dam, a city garage, two municipal swimming pools, extensive park improvements, and a topographical survey.

During these rapid strides of growth, some of Flint's public-spirited citizens initiated a city plan that is fast becoming a realization. To the City Engineering Department falls a major portion of the execution of this plan. The importance of topo-

graphical maps in solving one of Flint's most urgent problems, namely, plans for a comprehensive sewerage system, as well as in giving valuable aid to the city plan, was recognized by E. C. Shoecraft, City Engineer, and as early as 1915 he started action toward having a topographical survey made. This was not accomplished, however, until 1919, when arrangements were made with R. H. Randall & Company, topographic engineers, of Toledo, Ohio, for making a complete survey of the city and the surrounding territory. It is expected to complete this work in 1922, when an area of 60 square miles will have been mapped.

The survey is controlled by triangulation supplemented with precise traverse. Iron posts bearing bronze caps are set in concrete at the four corners of each square mile, tied to triangulation by precise traverse, over which accurate primary levels are run. All mapping is being done by plane table method and tested by check pro-



TOPOGRAPHICAL MAP OF A PART OF FLINT, MICH., USED IN SEWER DESIGN

files, the scale of map being 1 inch equals 200 feet and a contour interval of 1 foot. The average triangle closure in triangulation is 1.99 seconds, and the discrepancy between bases, 1 in 24,000. The accompanying facsimile will illustrate how admirably suited the resulting maps are for studying any section of the city in its relation to any other section. With such maps it is possible to pick out the hills and hollows and accurately scale their location from definite objects. Profiles can be picked off and estimates of cut and fill made with an accuracy sufficient for nearly every purpose. It is the most logical basis for planning and developing a park system, street and boulevard layout, or sewerage system, and is of inestimable value for solving the many details that are common to the development of any city.

A specific instance of the great value of the topographic survey to the city of Flint was in making a comprehensive study and design for a system of sewers that will amply serve the city's needs, not only now, but for a great many years in the future. Examples of so-called piecemeal sewer design and construction are to be found in practically every city. These mistakes are a cause of inconvenience to the public, and some time or other necessitate an additional expenditure for correcting, which could have been avoided had a broad, general plan been formulated.

In laying out a comprehensive sewerage plan for a city, the problem resolves itself into two well-defined steps:

1. To collect and concentrate the sewage for present and future treatment at the minimum number of points consistent with economy
2. To determine the degree of sewage treatment necessary for the present, and as nearly as can be for the future

Only step one is of interest here. This is divided into four parts, as follows:

1. To determine the present and estimate the future population and area which may be served
2. To determine the quantity of sewage which may be expected in the future
3. To formulate a general plan or policy for collecting this sewage in a satisfactory and economical manner
4. To design engineering structures to carry out this policy

The development which is likely to take place in any one portion of a city is directly influenced by its topography. For instance,



THE DISTRICT MAP

certain areas are well suited for parks and playgrounds, and others for residential or industrial development. As the topography has a direct relation to the type of development which will take place, this development determines the quantity of sewage flow to expect from each area. If considerable industrial development is to take place, there is reason to believe that the volume of sewage from this area will be large. In collecting the sewage from a number of areas, the topography is the controlling factor, as it enables one to select the most logical routes for intercepting and trunk line sewers. In designing sewers to carry out the general plan, a profile of each sewer line is a necessity in order to select the most economical size and determine the proper grades. Where an accurate topographic map is not available for the purpose, costly isolated surveys and inspection of territory will be made, which are rarely of value for any other purpose than the one under consideration. Such surveys are always found to be inadequate and lacking in information,

and do not give the opportunity to plan in a large manner for the future.

The Maps Aid Quick Estimating

In a great many instances, a mere inspection of these sheets to one familiar with sewer design is sufficient to determine the most economical sewer design for the area in question. As usually happens when there is a demand for such improvements, time for the making of such maps is not available. We have had numerous instances where complete plans and estimates of costs for sewerage certain districts have been made on short notice. Were it not for these topographic sheets, this would have been impossible.

In using the topographic maps to lay out a comprehensive plan of sewerage, it is first necessary to determine the main drainage areas, which in turn decides the number of trunk and intercepting sewers necessary to concentrate the sewage at the minimum number of points. Next, the natural outlet for the area is determined, after which the sub-areas all tributary to this outlet are determined. Certain assumptions having already been made as to the probable development in each area, it is now possible to compute the volume of sewage to expect from each sub-area. From the topographic sheet, the concentration point for sewage from

each sub-area is selected, which now gives all necessary information from which to design the sewer. A plan and profile is next plotted, and then sizes and grades of the sewer established. From these topographic sheets it is possible to select any number of proposed sewer lines, to determine which one is best.

While it is reasonable to expect that the demand for sewers in each sub-area will not follow exactly the natural drainage limits as outlined, a certain amount of redistricting is possible which will not affect the design of the trunk sewer for the larger area.

The reproduction accompanying this article shows in a general way the comprehensive plan of sewerage for the city of Flint, its main drainage areas, the existing and proposed trunk and intercepting sewers to collect the sewage from each area, and, finally, the main or East Side interceptor, which collects the sewage from all these areas and will concentrate it at one point for treatment.

The topographic map has made possible this comprehensive plan, which provides for an area of nearly 70 square miles with a population of 500,000 people. It has given an opportunity to work out different ways of doing the same thing, to find out which is best and most economical without the costly alternative of experimental building.

Golden Jubilee Convention of the I. A. F. E.

The Golden Jubilee (50th Annual) Convention of the International Association of Fire Engineers, and the 29th Annual Convention of the Pacific Coast Fire Chiefs

Association, will be held jointly in San Francisco, Calif., from August 9 to 18, 1922. Invitations have been forwarded to fire chiefs and fire prevention and fire protection engineers in all parts of the world, and the aid of the U. S. Diplomatic and Consular Services has been enlisted, to the end of having the whole world know of this fire chiefs' congress coupled with the most complete exhibition of fire apparatus and fire appliances yet held. Thomas R. Murphy, Chief Engineer of the San Francisco Fire Department, will be glad to send further information to those interested.



SAN FRANCISCO MUNICIPAL AUDITORIUM, WHERE THE CONVENTION IS TO BE HELD



GENERAL VIEW OF THE CAMDEN, N. J., WATER-WORKS

Metering a Water-Supply at the Pumping Station

Camden's Water-Supply—Its History—Principal Features of the Present System

By James H. Long

Chief Engineer, Water Department, Camden, N. J.

THE first public water-supply of the city of Camden, N. J., was furnished in 1845 by the Camden Water Works Company. The original plant soon became inadequate to meet the increasing needs of the city, and was enlarged from time to time, until in 1870 it was purchased by the city. This plant was operated by the city for about 30 years.

The city early undertook an investigation to consider the feasibility of artesian wells. These tests demonstrated conclusively that there was plenty of pure water in the territory to justify a system of this kind, and in 1898 the existing water-works system was superseded by the present artesian well system at Morris station.

As the city grew, the maintenance of pressure and the continuance of the requisite water-supply became difficulties of ever-increasing importance. In 1907 the Board of Trade urged the city officials to undertake another investigation and to submit recommendations for taking care of the future needs of the city. W. H. Boardman, Jay M. Whitman and J. W. Ledoux were selected, and their report recommended the purchase

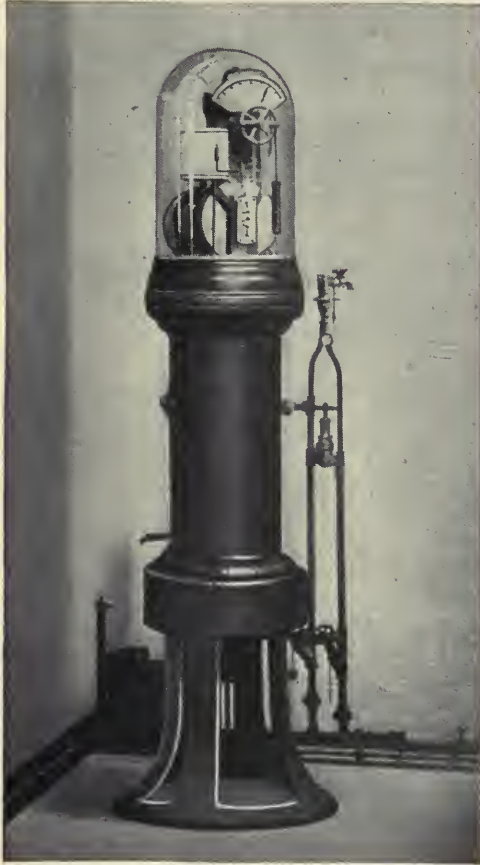
of new strainers, the introduction of water-meters, a storage reservoir, the development of the well field above the Morris station, and the abandonment of the Pavonia station.

In 1908 the City Council authorized the purchase of land on the Delaware River front at Delair for the purpose of driving wells to augment the water-supply. The fifteen wells that were driven demonstrated that water in considerable quantities could be obtained. Nothing was done until 1915, when a number of additional wells were driven, the present Delair pumping station was erected, and this entire field connected up separately from the main pumping station at Morris. The Delair discharge main is directly connected with the 30-inch main from Morris station, so that both stations can be operated independently or together, as desired.

The benefits brought about by the Delair station were apparent at once. The pressure was immediately increased, the service improved and the load on the Morris station relieved to such an extent that at present it is rarely necessary to operate the large air compressor in that station. The entire ca-



METER TUBE BEFORE INSTALLATION AT PUMPING STATION



RECORDING DEVICE FOR METER

capacity of the Morris station, amounting to about 5,000,000 gallons per day, is available as a reserve.

The Delair plant is one of the most modern pumping plants in the vicinity of Camden. The yielding capacity of the 22 wells now connected is about 5,000,000 gallons per 24 hours. The pumping plant consists of two 5,000,000-gallon Wood centrifugal pumps, each pump directly connected to a

200-horse-power Westinghouse synchronous motor, current for which is supplied by contract with the Public Service Company. The wells are connected by direct suction to the pump, and the discharge is direct into the main.

The pumping plant at Morris station consists of two 10,000,000-gallon Holly pumps and one 10,000,000-gallon Blake pump. The wells at this station are pumped by means of air-lifts. About one-third of the capacity of the plant is obtained by air-lift.

Altogether, the source of the Camden water-supply consists of 102 artesian wells at Morris and 25 at Delair, varying in size from 8 to 12 inches. There are 130 miles of mains ranging from 3 to 36 inches.

Two Simplex Venturi tubes are installed for measuring the water supplied to the city—one at the Delair pumping station, 20 by 13 inches in size, having a maximum capacity of 16,000,000 gallons per 24 hours and connected to a meter register, and a second Venturi, 36 by 12 inches, at the Morris station. This tube is operated with a meter register specially designed for a large Venturi differential head of 24.93 feet, and built for a maximum capacity of 21,000,000 gallons per 24 hours. Both of these meter registers were installed in 1916. Recently the city has approved the installation of a Venturi tube meter register for measuring the water supplied to a large industrial consumer.

In every instance the meter chosen was selected because it gives a graphic record of the consumption by means of which the maximum and the minimum flow can be accurately analyzed, the nature of the service determined, and the total number of gallons supplied obtained. This type of meter was also favored, inasmuch as it is permanently accurate, and the attendance and the repair cost required are negligible.

The reason that many municipalities have poor health service is on account of citizens who don't know, don't care, and will not take the trouble.

—Public Health, State Department of Health, Lansing, Mich.

The Women's Court of New York City

By Frederick H. Whitin

Secretary, Committee of Fourteen

WOMEN charged with prostitution in New York City are tried in the Women's Court. This special court, established in 1910, is for the more effective repression of prostitution by the restoration of those who have fallen and the punishment of those who persist in continuing the life despite the certainty of jail sentences.

The magistrates who preside in the Women's Court are especially designated by the Chief City Magistrate. The Women's Night Court was the first of the Magistrates Courts in New York City to use finger printing for purposes of identification. These prints, taken only of those convicted, disclose the record of prior convictions and sentences, from which the magistrate may determine the proper sentence.

From these records it appears that 60 per cent are convicted but once, this proportion showing a tendency to increase. The large number of women thus shown to be continually entering the life indicates a very serious problem; it also raises the interesting question, what becomes of those who are not rearrested? It is believed that they discontinue the life.

At the time of the establishment of the Women's Court a considerable proportion of those convicted of prostitution were sentenced to pay a fine of \$10 or less, but by agreement between the magistrates this sentence was discontinued in 1912, and a year later the provision therefor was stricken from the law.

In 1915 a "Parole Commission" was appointed with power to determine the sentence to be served by those who had been convicted, according to the finger print records, four or more times. The maximum detention under the law creating the Commission is two years.

In 1918 the General Health Law was amended to provide for the examination for venereal disease by the Health Department of all persons convicted of prostitution. Fifty per cent are found to be suffering from such diseases in a contagious stage and are committed to a special hospital

until the contagious period has passed. When returned to court for sentence, the judge takes into consideration the period of hospital detention and the conduct of the prisoner while there.

The judges presiding in the Women's Court refer to the probation officers attached to the court for investigation all those convicted for the first time. If it appears there is any chance of reformation, they are returned to their families and friends on probation. In the less favorable cases, the woman is committed to a reformatory institution or given a short workhouse sentence. In the apparently hopeless cases the average workhouse sentence is about ninety days.

In the first full year of the Women's Court (1911) the total number of arraignments for prostitution was 5,365, falling to 2,898 in 1913, on account of the discontinuance of fines. There was an increase in 1915, and a further drop in 1916 to 2,132, due to the Parole Commission Indeterminate Sentence Law. The year of 1918, with its war disturbances, showed an increase of cases, followed by a sharp drop to 1,308 in 1920.

When the Women's Court was first established in New York, practically all the defendants were charged with street soliciting. A general law against prostitution was secured in 1915, and widened in 1919, so as to include not only the person who offers to commit prostitution and related acts in any place, but also those who aid and abet in such acts. It has been decided but very recently that the customer of the prostitute is not included in this latter phrase. Such an inclusion will be the next step in repressing prostitution, following the example of the Narcotic and Liquor Acts.

The Women's Court is now the center in New York of the law enforcement efforts to repress prostitution. Associated with the Court are many volunteer agencies which are rendering assistance in the constructive work of the Court in rescuing the girl whose acts have resulted in her conviction for immorality. To the work of this Court, more

than any other, can be attributed the repression of prostitution in New York City. From being the worst of American cities for street soliciting, the metropolis has become a leader, its streets being now extremely free from patrolling by prostitutes, and

wider laws, good police work, a special court and judges, by methods of identification and effective probation work, and the assurance of punitive sentences for those who persist in the life. While the number of cases in the Court is now small,

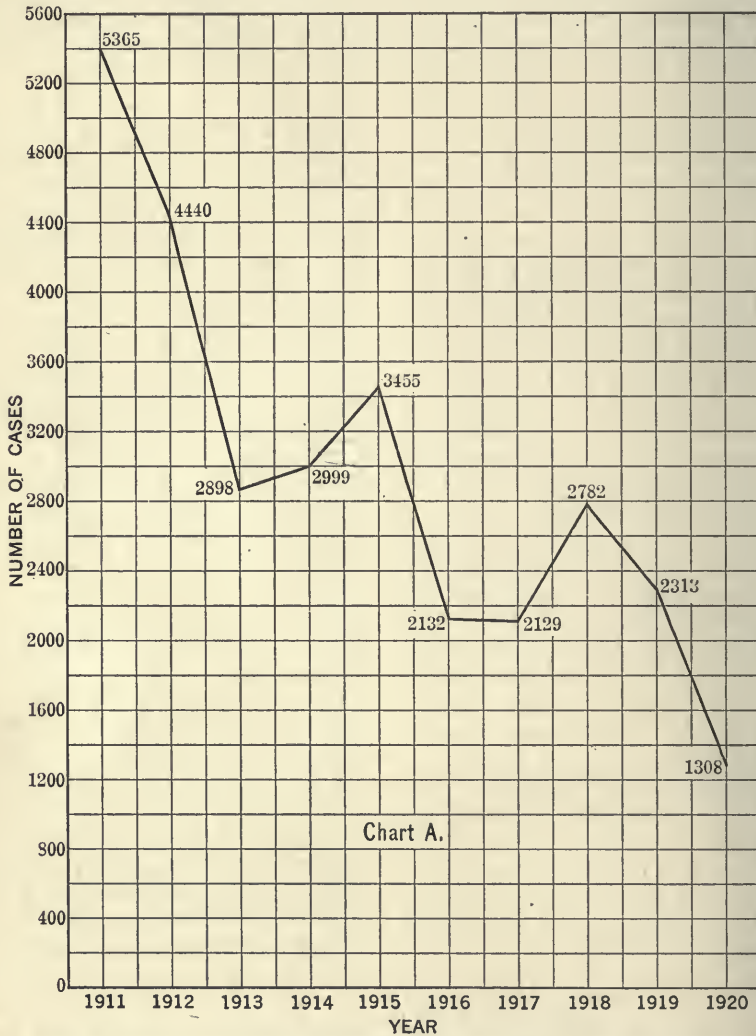


Chart A.
THE WOMEN'S COURT ARRAIGNMENTS, SHOWING AN IRREGULAR, BUT PRONOUNCED, DECREASE

while the "scarlet woman" can still be found by those who know how and who have the means, she is not in evidence to the general observer, or obtained by the casual seeker. This result has been secured by new and

as compared with a decade ago, the work of the Court must be continued until that happy day when education and an improved moral sense restrict the prostitute to the psychopathic.

The Popular Parks of Springfield, Ill.

By O. F. Davenport

Assistant Manager, Springfield Chamber of Commerce

"Thirty Thousand People Throng Bunn Park"

THIS headline flashed across the columns of Springfield's dailies on July 15, supplies an answer to the oft-repeated question, "Do people really appreciate their public parks?" Springfield is a city of 60,000. On July 14 half the population of the city spent an afternoon in one or another of its chain of nine parks, enjoyed an open-air supper there, and did not leave for home until late in the evening.

The point is that not only has Springfield a park system which in facilities and natural beauty equals that of any other city of its size in the country, but its people are enthusiastic about their parks. They use them, with slight interruption, all the year round. There is no especial significance in the announcements of the newspapers on July 15, even though the occasion of the 30,000 throng was the annual outing of the Springfield Chamber of Commerce. The

fact is, not a day passes that the parks are not lived in by a large section of Springfield's population. They are in every sense a highly successful recreational utility.

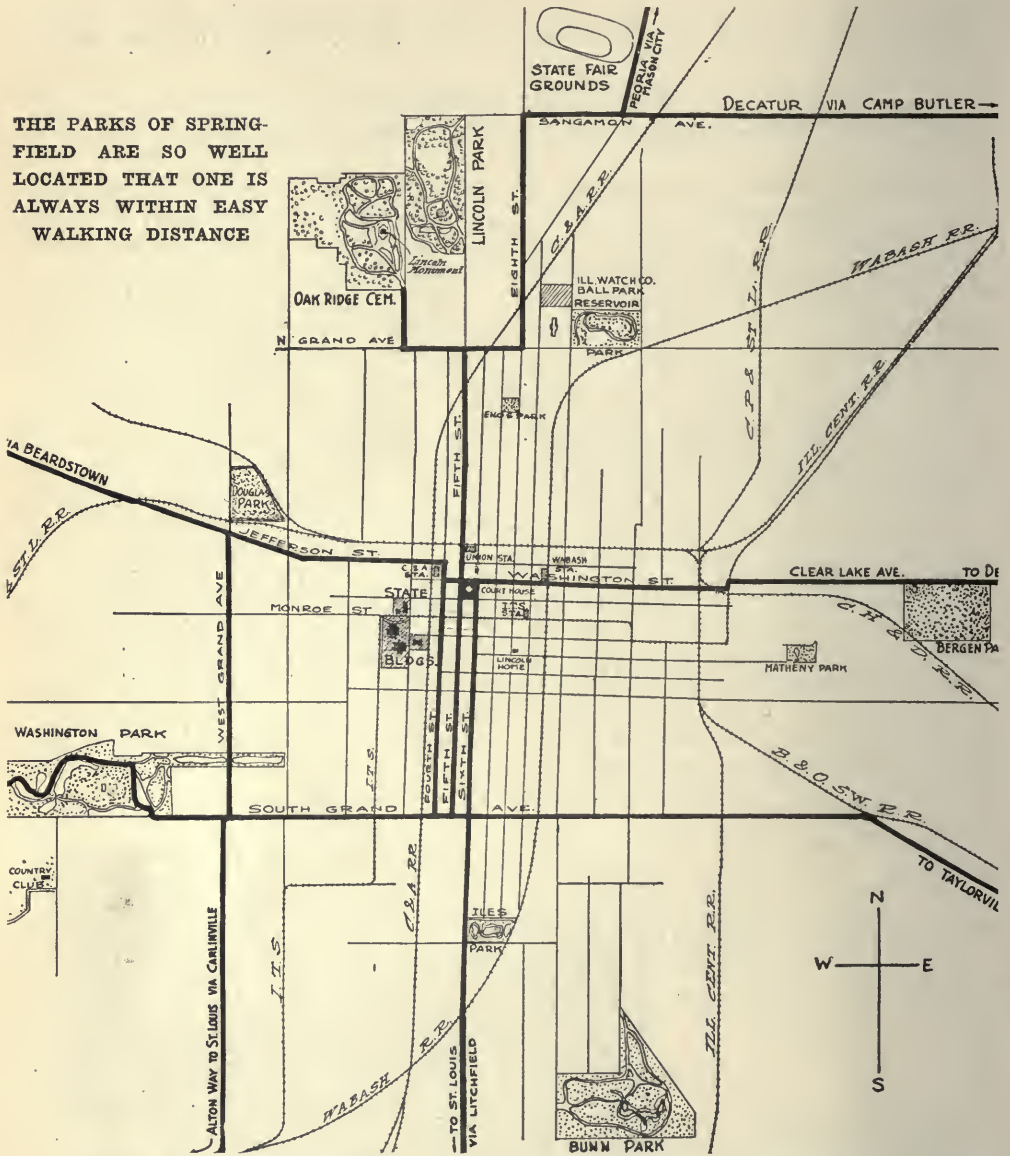
The taxpayers of Springfield have invested \$1,250,000 in parks, and they expend annually \$80,000 in maintenance. All outstanding obligations total less than \$80,000. The board exercising control does business on a strictly cash basis. Several years ago it emancipated itself from the practise of spending the next year's income before it was collected. The borrowing of funds in anticipation of the coming year's taxes was the natural result of the prudent policy of the park system pioneers in acquiring extensive properties early and before natural beauties could be defaced. The board now not only lives within its income but during the past year has filled the remaining gap in the chain of open spots adjacent to every district, by acquiring out of its ordinary revenue a new park at a cost of \$20,000.

WHETHER ONE IS SEEKING
THE QUIET OF A RURAL
SCENE OF WOODS AND
STREAMS



OR THE MORE CROWDED
GAIETY OF A BATHING
BEACH, THE PARKS OF
SPRINGFIELD CAN SATISFY
THE NEED

THE PARKS OF SPRINGFIELD ARE SO WELL LOCATED THAT ONE IS ALWAYS WITHIN EASY WALKING DISTANCE



Varied Recreational Facilities

There is nothing in the wide field of park utilization that Springfield's system of nine parks, including in all approximately 550 acres, does not afford. They contain facilities for every variety of sport, including two extremely attractive golf courses, one of nine and another of eighteen holes, a special field for trap-shooters, a bathing beach where one can secure suit, soap, towel and use of hot and cold showers for fifteen cents, playgrounds in generous abundance, beautiful, smooth drives, and spacious pavilions which serve drinks and meals at

lower prices than down-town stores. Needless to state, all the regular features, such as baseball diamonds, boating, tennis courts, football fields, dancing places, croquet grounds and similar diversions, are plentifully supplied.

The Springfield park board is not content with furnishing its constituents with a comprehensive park system. It has done a wonderful job of popularizing the parks with the people of the city. Use of the parks is a daily feature of family life. The head of the household leaves factory, store or office in the late afternoon to join a party

at golf, tennis or other sport of his choice, following with a shower or a plunge in the pool, and topping off with a neighbors' reunion at supper served in the convenient picnic grounds. The evening hours are spent in the enjoyment of an open-air picture show, or on the moonlit waters of a restful lake, or possibly in dancing in the comfortably furnished pavilions.

Tourist Camps Provided

The stranger not only enjoys all the privileges of the home folks, but has in addition the advantage of saving hotel expenses by being allowed to camp in the parks at night. Because Springfield was the home of Abraham Lincoln, it is the Mecca of many thousands of tourists annually. Accommodations for the night's stay are provided in tourists' camps located in three of the parks. Routes to the camps are marked for the convenience of the visitor. The camps are furnished with electric light, water and cooking arrangements. They are

ideally situated on high ground in shady groves. This service is greatly appreciated by the traveling autoist and, in common with all other park accommodations, is furnished free of cost.

Bringing the Parks to the People

The first park board, twenty years ago, was urged to concentrate its effort on a single large area, but the members acted on the theory that to make the parks serve their purpose they must be brought to the people, and not the people to the parks. The policy then determined on was that citizens in every vicinity were entitled to a park within a reasonable distance of their homes. This plan has been gradually developed by succeeding boards, until to-day, with nine parks in operation, residents in any section can enjoy the great outdoors by walking a few blocks from their front doorsteps.

The natural adaptability of the sites chosen rendered unnecessary any large expenditures for creation of artificial features.

In the selection of sites and their improvement, repetition has been skillfully guarded against.

Property Values Increase

The parks have contributed in signal fashion to the growth and development of the community. They have exerted a powerful influence in the building up, contiguous to their boundaries, of handsome residential neighborhoods, which demand pavements, sewers and other general betterments. A tremendous increase in property values has followed. Springfield people will tell you that the value of their park system cannot be estimated in dollars. They may add that while others have cost more and may be more expensive to maintain, none can meet the ultimate test of value more satisfactorily.



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NOT A SCENE IN SPRINGFIELD, ILL., BUT WHEN PARKS AND PLAYGROUNDS ARE NOT PROVIDED, THE CHILD HAS NOWHERE TO PLAY EXCEPT IN THE STREET

It would interest you to know that—

Towns May Secure Help in Establishing Playgrounds

Business men the country over will be interested in a new foundation, incorporated not for profit, established in New York by William E. Harmon. The corporation is to be known as the Harmon Foundation and will have several divisions as need for them arises. The work for the present will consist in the establishment of playgrounds in towns and small cities, and in advancing loans to college students through the organization of mutual aid societies. Later, divisions of vocational guidance and counsel to social organizations in matters of finance and publicity will be organized.

One theory back of the Harmon Foundation is that money given to people or organizations outright does not do as lasting good as money given in service and organization that will bring more money and help people to help themselves. Mr. Harmon has been connected with many social organizations for years both as contributor and active board member, and feels that obligations are too easily discharged by a gift of money—and no inquiry as to the manner of expenditure. He proposes to spend the remaining years of his life and much of his money in carrying thirty years of wide business experience into the social work that interests him and needs him most, knowing that the application of sound business principles to many social movements will release thousands of dollars in the country for wider service.

The entire time of the staff is now being spent in helping towns establish playgrounds. A plan has been devised whereby playgrounds are opened up like a big real estate development. The Foundation secures an option on the property desired, advancing money for its purchase, only when necessary and advisable. Then the Field Secretary of the Foundation organizes the school children of the town as a selling force, and citizens as sales managers, and conducts a big land sale, capitalizing the advertising and selling power of children in a fascinating educational way, the Founda-

tion furnishing all advertising material, organization of local committees, and complete direction of the work.

This part of the work is no longer a theory. It has been demonstrated in one town of five thousand. The children sold their own playground, the work united the town in a civic project as it was never united before, and proved that Mr. Harmon's plan can be a boon to many other towns.

Miss Ethel L. Bedient, Director of the Foundation, will welcome inquiries and calls for help either by letter or a visit to the offices of the Foundation at 140 Nassau Street, New York City.

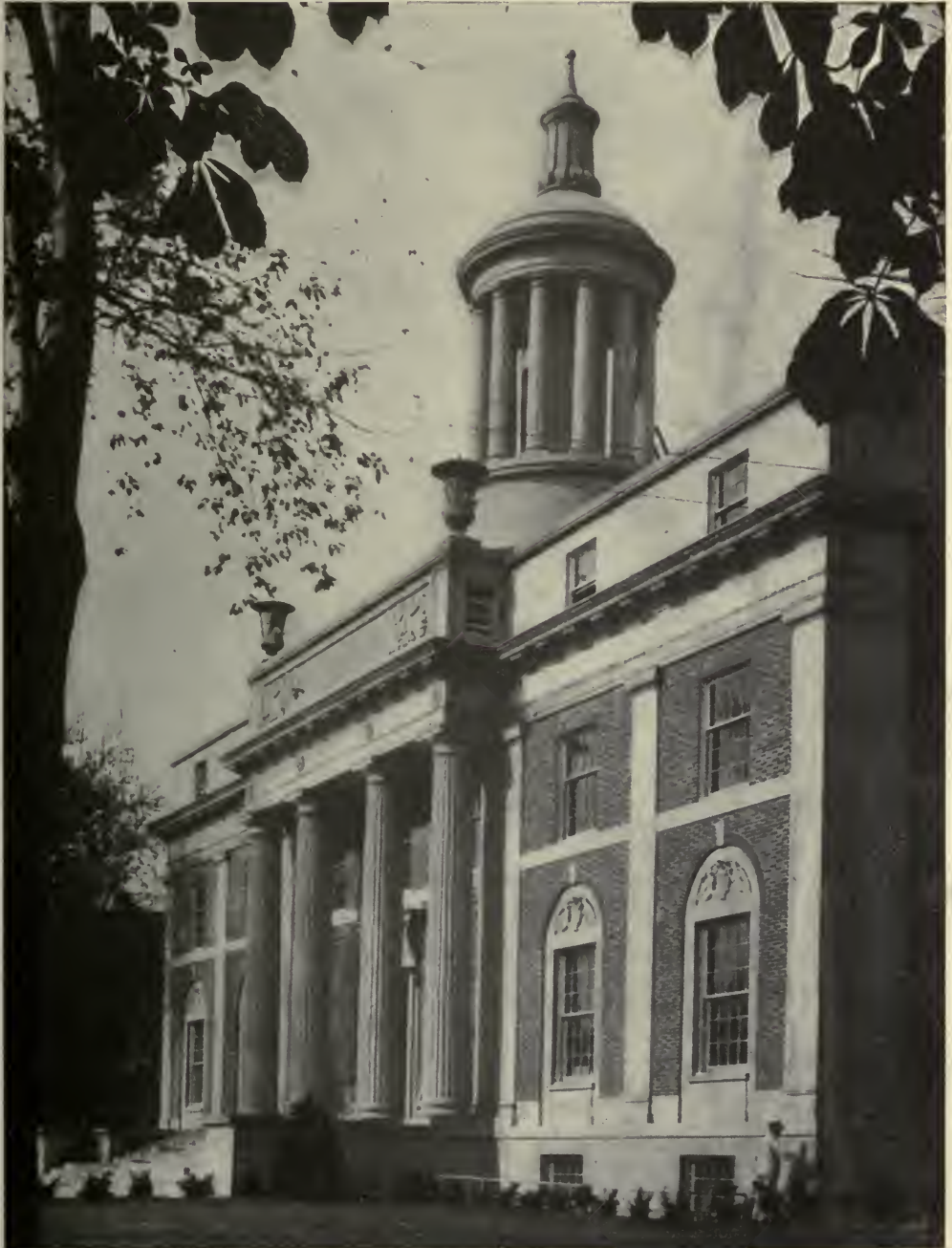
Premature, Piecemeal Zoning Receives a Setback

Friends of city planning in Pittsburgh were rudely awakened the other day by a decision of the Supreme Court in the case of James Coyne against Charles B. Prichard and others in the matter of granting a permit for the erection of a public garage in a place deemed unsuitable by the City Planning Commission.

It seems that the City Planning Commission, which, under Pennsylvania law, was created as an executive department for cities of the second class, was given power to regulate and redistrict the areas in which trades and business of various kinds can be carried on. The appointees in Pittsburgh have undertaken redistricting, but as yet no recommendations have been made to the Council and no hearings have been held. Nevertheless, the Commission has sought to prevent the erection of undesirable structures by recommending to the Bureau of Building Inspection that permits be withheld. The latter thereupon declined to issue permits opposed by the City Planning Commission.

The Court, reviewing the case, noted that the City Planning Commission had not made recommendations to the Council for a city-wide zoning ordinance, that hearings on its recommendations had not been held, and that therefore it was without legal authority until such procedure had been completed.

Beauty in Municipal Architecture



Courtesy Architectural Record

MAIN FACADE, MUNICIPAL BUILDING, PLAINFIELD, N. J.

Lawrence F. Peck and W. L. Bottomley, associated architects

An Attractive and Useful City Hall

Decorative and Practical Features of New City Hall at Waterbury, Conn.

THE present City Hall of Waterbury, Conn., which was completed in 1915 and occupied by all the municipal departments early in 1916, has many attractive as well as practical features of interest to those who may be called upon to suggest designs for new city halls in other municipalities.

Following negotiations for the transfer of

opened during Old Home Week, November, 1915, although many of the departments did not occupy the building until January, 1916.

The City Hall is situated on Grand Street, adjoining the Library Park, and commands an approach to the center of the city through Leavenworth Street. The entourage which fronts the length of the building on Grand Street is its show feature. The



GENERAL VIEW OF THE WATERBURY, CONN., CITY HALL

the title of the property where the City Hall now stands, the Commission held a competition, conducted by Professor W. P. Laird of the University of Pennsylvania, to select an architect to design and supervise the construction of the new City Hall. The plans of Cass Gilbert of New York were selected, and on July 8, 1914, the George A. Fuller Construction Company, New York City, signed the contract to construct the building. In the early part of August, 1914, ground was broken. The appointment of two supervisors, Charles M. Gasson for the construction company, and Frederick C. Peckwell for the city's interest, took place shortly after. The building was officially

ground within a low, rounded marble coping which separates it from the broad, encircling sidewalk is laid out in formal Colonial style, which harmonizes with the delicate red and white ornamentation of the façade. At the edge of the sidewalk at regular intervals are placed five decorative 18-foot bronze lamp standards. The approach to the central feature is by white marble steps, flanked on both sides by smaller auxiliary stairways, also of white marble.

The fountain in the center is surrounded by a pavement of red brick inset with white marble bands, enclosing a large circular slab. At the main entrance are two decora-

tive vases or urns of white marble several feet in height, from the base of each of which, through the mouth of a carved satyr, jets a stream of water flanking the central fountain.

The building, which is of Colonial design, is built around a rectangular court, laid out as a sunken Italian garden. It is not only the office building of the city and town officers, and the home of the probate and city courts, but also the headquarters of the fire department and the police department. The east wing is devoted to the fire department and the west wing to the police department. The main portion is three stories high with a roof and cupola tower with a four-dial clock, a gilded dome and a weather-vane. The other three sections are but two stories high.

The exterior of the building is of Vermont marble and North Haven brick. Marble blocks form most of the walls of the first story, and marble pillars rise to the roof between the windows of the main portion of the building. At the east and west ends, on marble slabs set into the walls of the third story, are ten different designs in bas-relief, significant of the city's character and industries. A marble fence surrounds the roof of the main building.

The Offices

The collector, assessors, probate court, board of charities, town clerk and city clerk have offices and vaults on the main floor. The basement provides for janitors' rooms and storage rooms, heating plant, a store for the board of charities, a laboratory and nurses' room for the board of health, testing rooms and storage rooms for the engineering department, and rooms for the sealer of weights and measures. On the second floor are the offices of the mayor, the personal tax collector, the board of public works, city court judge, the jury room, lawyers' room, juvenile court room, city court clerk's and prosecuting attorney's offices. At the Field Street end of the building on the second floor is the aldermanic chamber, which occupies both the second and third floors, and at the west end of the building is the city court room, extending through to the third floor.

On the top floor are the drafting rooms and the offices of the city engineer's department, the probation officers' room, and offices for the corporation counsel, health officer

and inspectors and board of health, registrars of voters, city sheriff, park superintendent, building inspector, and telephone exchange. In this portion of the building the corridors are built with marble floors and the trimming is of white wood enameled to an ivory finish. Throughout the rest of the building the floors are terrazzo and the woodwork of oak.

On the Field Street side are the fire headquarters, with the apparatus room, repair shop, firemen's waiting-room and toilet rooms on the main floor. On the second floor are the offices of the board of public safety, with offices and rooms also for the officers of the fire department and bedrooms for 21 firemen. There is a fine shower-bath room and toilets for officers and men, linen closets and a recreation room, some of these occupying the rear portion of the building.

In the police wing of the building there is a large drill hall in the basement, locker rooms, sergeants' room, smoking-room, storage rooms, toilets and shower-bath. There is also a large room in which the homeless are provided with sleeping accommodations.

On the first floor are the offices of the police department officials, a men's cell room with thirty cells and room for ten more, detention rooms and a police garage, the entrance to which is from the rear of the building. The second floor accommodates the detective bureau with offices, a Bertillon room, a dark room, a detention room for women, a cell room with ten cells for women, the matron's office, bedroom, living-room and kitchen.

Directly facing the main street entrance is the 10-foot main inner staircase of white marble, which, ascending 26 steps to a first landing, branches to either side and winds up and back to the second floor. Leading to the right and left of the first floor central hall are two corridors all in white marble and both with lofty ceilings in the same design as the main hall. On both sides of these corridors are the first set of city offices. At the end of the corridors are the side entrances of the building, reached by marble steps. The corridors are 14 feet in width, with all the office doors inset in arched alcoves, which are duplicated at regular intervals along the wall of the corridors. The lighting for the main hall and corridors is furnished by ten large decorative bronze hanging fixtures strung through the center of the corridor and grouped in

the main hall. At the left of the staircase on entering is located the elevator.

The corridors and ceilings are decorated in grayish-ivory relieved by soft buff and violet in the coffer. All of this decorating, as well as that in the special rooms, was done by Arthur Willetts of New York. Featured in the artistic decoration of the building are the ten circular bas-relief inset medallions. Six are set in the front and two each in the Field Street and the Library sides of the structure. They symbolize Truth, Prudence, Industry, the City Seal, Commerce, Force, Law, Justice, Wisdom and Order.

The aldermanic chamber is of noble proportions with a lofty, elaborately decorated ceiling. The walls are of greenish-gray plaster and rise from a white base. All carry inset fluted white columns. For illumination there is a massive hanging cluster

of lights set in two concentric circles, the larger outer circle carrying 27 lights in the form of imitation candles, and the inner circle 13.

Over the president's seal are inscribed the words, "Let not mercy and truth forsake thee: bind them about thy neck; write them upon the tablet of thy heart. So shalt thou find favor and good understanding in the sight of God and man." (Proverbs III.)

The city court room at the west end of the corridor is finished in much the same style as the aldermanic chamber and is of the same generous proportions. It has the same massive pendent light cluster. The walls are treated in a grayish motif relieved by decorative motifs in the frieze and panels. Over the judge's bench is inscribed, "The foundations of justice are that none shall be harmed and the commonweal be served."

A Priceless Gift to a City

The Frederick Remington Collection in Ogdensburg, N. Y.

By James B. Moreland

THE curios collected by Frederic Remington during his life among the Western pioneers and Indians have recently been placed on display in an appropriate museum in Ogdensburg, N. Y. This authentic record of the Western frontier is now available as a wealth of information for the student's research.

The curios have been grouped for the greatest facility of study. The Indian relics, magnificently ornate with beading and decoration, have been assembled in tribal order. Many of these specimens are very valuable and were fashioned especially as a mark of the Indians' esteem of the sculptor. Closely related to this group is the display of cowboy and Mexican appurtenances. There are also a number of interesting curiosities from all quarters of the globe, several of which have been traced back to the 11th and 15th centuries. This department also includes a well-stocked magazine of fire-arms furnished with every type of weapon up to the time of Mr. Remington's death.

The display of the artist's talent comprises his best canvases, bronzes, and sketches. The bronzes for this collection are the last ever to be cast, cessation of their production

having been ordered by Mrs. Remington.

Perhaps the most valuable feature of the exhibition is a collection of old histories of the Western frontier, many out of print.

This collection was given to the city of Ogdensburg by Mr. Remington's widow, and George Hall and John C. Howard, by a joint contribution of \$100,000, purchased and remodeled the historic Parish residence as a suitable museum for its display. In its ample apartments the exhibition has been conveniently arranged and students will find there a great opportunity for interesting reference.

Mrs. Remington's will provided for the maintenance of the exhibition after the death of one of the beneficiaries of the estate. The city of Ogdensburg is appropriating annually \$4,000 to defray the yearly upkeep of the museum until the legacy shall become available.

The destruction of the priceless canvases was recently averted with the utmost effort when the Public Library, where the relics had been stored pending the remodeling of the Parish residence, was wrecked by fire. The works of art were saved, however, and are now installed in their permanent quarters in the Parish Mansion.

Forward Steps in Municipal Affairs

Mayors

A Park Which Has Set Standards for Evansville

EVANSVILLE, IND.—It has been demonstrated beyond doubt that parks properly designed, built and maintained enhance and stabilize real estate values within their zones of influence, as well as elevate public taste. A striking example of this is in the effect wrought in Evansville by Garvins Park, which was built by the American Park Builders of Chicago eight years ago.

Land for this park was purchased against considerable popular disapproval, and the park was built at the cost of some \$85,000, a considerable portion of which was donated. The land was beautifully wooded and was bisected by a deep ravine, which was dammed to form an artificial lake. The dam consisted of an earthen embankment 30 feet high with a 1:2½ slope, and was

reinforced by a brick core, which carried the overflow. The water for the lake, although increased by city supply, is furnished by a very limited watershed. Contrary to expectations, the supply from this source is adequate, even during dry seasons, and the earthen dam after eight years holds the water perfectly.

The land was covered with a dense growth of oak, gum and elm, and it was found desirable to remove large numbers of these fine trees in order to thin the plantings properly and to form open glades. Oftentimes trees measuring 3 feet in diameter were blasted bodily from the ground, and although great criticism was aroused at the time, the people now are fully appreciative of the wisdom of this procedure.

The entrance to the park is formed by an avenue some 600 feet long, bordered by elms. This avenue is terminated by a stone entrance, backed by planting, with a pool and fountain in front of a cut-stone design which bears an inscribed tablet.

To the right of the entrance is a concrete stadium, facing the football and baseball



TALL ELMS BORDER THE ENTRANCE TO GARVINS PARK, EVANSVILLE, IND.

field, and to the left are a bath-house, a swimming pool, a children's playground, a comfort station, a wading pool and a pergola, designed in a harmonious group. So popular is the swimming pool that this structure has since been duplicated on several other sites within the city, with similar success.

Since the building of the park, a marked development of surrounding land has taken place and prices have advanced several hundred per cent. Better homes have been built than formerly, raising the standards of living.

Encouraged by the success of this venture, the city administration later purchased an extensive mountain tract, which is soon to be developed. Here it is planned to include an eighteen-hole golf course, a swimming pool fed by salt-water wells, a race-track and other athletic features. The significant fact is that comparatively little opposition is now shown towards the expenditure of public money on this project.

The city government has recently appointed a plan commission whose work it will be to prepare a comprehensive plan for the improvement and future growth of the city. These and other progressive steps in Evansville have been to a large degree made possible by the powerful though quiet influence Garvins Park has exerted on the public mind.

BENJAMIN BOSSE,
Mayor.



A VISTA IN GARVINS PARK

Finance Departments

Cheap Insurance for Municipal Employees

CALGARY, ALBERTA.—The city of Calgary, which has no general pension or retiring system for its employees, has arranged for their protection through the group plan of life insurance and also of accident and health insurance.

The life insurance policy was underwritten by the Canada Life Insurance Company, on a non-participating plan, beginning May 4, 1921. Every employee who wished to take out a policy for the amount specified for his group was granted full benefit without individual medical examination.

Like all group insurance, it is what is known as term insurance, the period being one year, but is automatically renewed so long as the group is retained at 75 per cent of the employees. Each year there is an adjustment, made necessary by deaths, lapses, or additions to policyholders. The premiums are determined by taking the rate for each age, totalling the amounts, and striking an average. Each employee pays the same rate per \$1,000. Although group insurance is usually written for the entire

group in case the employer pays the total premium, in this case the company was willing to write the policy in case 75 per cent of the employees accepted, since the premiums are paid jointly by the city and the insured. Three groups are provided for. The city pays 40 per cent of the total premiums, and the employees in all 60 per cent.

Before an employee can take out a policy, he must have worked for the city continuously for six months; but he may retain his insurance after leaving the city's employ,



PRACTICALLY EVERY BLOOM AT SACRAMENTO'S FLOWER SHOW WAS GROWN OUT OF DOORS
 This exhibition is part of a campaign to encourage the beautification of the city

provided he pays the entire premium, as due, to the city.

The popularity of this insurance is demonstrated by the fact that out of 900 city employees, 760 have already signed their contracts.

The scale works out as follows:

GROUP	Policy	City Pays	Em- ployee Pays	Deduct Monthly
All regular employees.	\$1,500	\$7.90	\$11.85	\$1.00
Assistant heads and executives	3,000	7.90	31.60	2.65
Heads and officials...	4,000	7.90	44.67	3.75

The city has also arranged for health and accident insurance with the National Benefit Assurance Company. This policy includes a payment of \$1,000 in case of death by accident, payment at the rate of 80 per cent of present wages or salary in case of sickness of not more than 10 weeks or 60 days, with limits of pay of \$100 for hospital fees, operation fees and medical fees. The total premium on this group policy amounts to one per cent of the monthly pay-roll, and the sum of 50 cents is deducted monthly from the pay of each municipal employee to cover part of the cost of this insurance. The premium cost to the city and employees is as follows:

	City	Employees
Group life policy.....	\$ 5,846	\$10,644
Accident and health.....	11,630	4,206

The plan is proving very popular.

JOHN I. ROBINSON,
 Chief Clerk, Public Works Department.

Park Departments

Sacramento's Municipal Flower Show

SACRAMENTO, CALIF.—On two perfect November days Sacramento citizens turned out in large numbers to the first organized free city flower show, held at the Crocker Art Gallery. There were two objectives in putting on this exhibition: one was, to bring citizens together at a place where they could see flowers and pictures—that is, for general recreation; and the other was, to make a start in a very definite effort for city beautification.

Plans for the prospective "Days of '49" celebration to be held in May require that Sacramento shall be as attractive as possible for the event, and accordingly a committee of the Chamber of Commerce, working through the City Park Department and on other lines, believed that one way to begin the campaign was, through the medium of a flower show, to start people thinking about flower planting.

The ball room of the old E. B. Crocker mansion, now Sacramento's Art Gallery, made an ideal place in which to hold the exhibition. It was hard for Eastern visitors to believe that practically every bloom seen

had been grown out of doors. Huge chrysanthemums of many varieties, larkspur, hybrid penstemons, dahlias of varied form and color, and other flowers were to be seen, some of them from the Capitol and City Park gardens, and a great many exhibited by private owners. Home gardeners about the city were urged to contribute, and responded well in bringing their best products for display, and all bouquets and specimens so contributed were given an honorable place and plainly tagged. One curious bouquet was composed of sixty-five varieties of flowers, herbs and vegetables combined in a very attractive way. A majority of the local florists contributed elaborately arranged exhibits, which lent a professional air to the whole.

Following out the purpose of the flower show, it is planned to push the campaign for home beautification through planting, by holding a midwinter or early spring show where there will be shown Sacramento's exceptional display of out-door-grown-camelias. Combined with this as a leading feature, specific information for planting home grounds will be given by plans and by lectures and a full exhibit of labeled plant material which the home owners may use.

FREDERICK N. EVANS,
Landscape Architect, Park Superintendent.

Public Welfare Departments

A Community Hall in a Wheat-Farming Section

ODESSA, WASH.—The community service idea is rapidly attaining strength in the Spokane district. One of the most recent

developments is the completion of a handsome community hall at Odessa, Lincoln County, 90 miles west of Spokane. Odessa is a bustling little city of 2,000, the center of a prosperous wheat-producing section.

The community hall was constructed by selling shares to residents and farmers in the section within the town's trading area, the Odessa Community Hall Association being incorporated with a capitalization of \$30,000, all of which was issued and expended on the structure. Henry W. Rieke is secretary of the company.

The main floor has an auditorium seating 500 persons. At the recent opening ceremonies 1,200 persons were crowded in. The second floor has a women's rest room and other apartments, including a dining-room and a kitchen. The structure also houses the City Council and the Fire Department.

H. W. RIEKE,
Secretary Odessa Community Hall Association.

Health Departments

From Power-Plant to Pool

PALO ALTO, CALIF.—The municipal swimming pool at Palo Alto is operated as a by-product of the city's power-plant. It is so popular that its discontinuation would be considered a calamity by the younger generation. It is strictly an open-air pool and is maintained during the whole year. There is no charge for admission, and on hot days as many as 500 persons have made use of it.

Electrical energy is generated in the Palo Alto plant by Diesel engines. These machines are water-cooled, and at first the water was passed over a cooler on the roof of the plant and used over again. This did not prove successful, and the hot water was turned back into the mains from which it first came. This raised the temperature of the domestic supply to such an extent as to be objectionable, and had to be discontinued. The idea of running the water into a wading pool for children then came to mind, and from this has grown



THE COMMUNITY HALL AT ODESSA, WASH.



THE WARM WATER IN THE POOL AT PALO ALTO, CALIF., IS RENEWED EVERY 32 HOURS AND STERILIZED, MAKING IT SAFE FOR BATHERS

the present municipal swimming pool.

The pool is circular in shape with a conical bottom, and is constructed of cement with a row of red brick around the top. The diameter is 100 feet, and the depth is 2 feet at the edge and 5 feet in the center, giving a capacity of a little over 176,000 gallons. These dimensions make it comparatively safe for children, and no guard has been necessary. The water enters at the center of the bottom and runs off at five skimming basins placed at regular intervals on the circumference.

The amount of water used for cooling the Diesel engines averages approximately 130,000 gallons per 24 hours. The temperature of the water leaving the engines is sufficient to maintain a temperature of 80 degrees F. in the pool. With 130,000 gallons of fresh water entering every 24 hours, the water in the pool is completely renewed each 32 or 33 hours.

To render the pool as safe as possible, from a health standpoint, and to prevent the growth of algae, the water is treated with chlorine gas and copper sulphate, about 1.3 parts per million of each. The heavy dosage has been found necessary to control the growth of algae, neither treatment alone being effective. In addition, the pool is emptied and scrubbed with unslacked lime once each week.

LOUIS OLSEN,
Health Officer.

City Managers

An Excellent Municipal Building Constructed at Low Cost

HICKORY, N. C.—The municipal building in this city, dedicated last November, is a good example of the economies that may sometimes be effected in municipalities by handling public works by day labor.

The city had appropriated \$125,000 for a municipal building. The lowest bid submitted for the building was \$118,000, which did not include an estimated \$20,000 for sundry other costs. After careful consideration, it was finally decided to entrust the work to the City Manager, who was familiar with building construction. He undertook the job with day labor, thus getting the advantage of the declining prices, the contractor's profit and bond, etc. When the building was completed, it was computed that the net saving on its construction amounted to \$27,072.39.

The building is admirably suited for the purposes for which it was designed. In the basement are located a workroom and store-room for the Water Works Department, a city school supply room, a toilet for colored people, a boiler room, and a dressing-room



THE MUNICIPAL BUILDING IN HICKORY, N. C., IS THE CENTER OF CIVIC LIFE

for the auditorium. On the first floor are the auditorium, the offices of the City Manager and the City Clerk, a ladies' rest room, comfort stations, police headquarters, a jail of solid concrete, and a fire truck garage. On the second floor are the firemen's dormitory, the fire alarm battery and switch rooms, a pool room for the firemen, the city council chamber and the city court room. The auditorium has a standard size stage and, with the balcony and gallery, seats 1,160.

R. G. HENRY,
City Manager.

Fire Departments

Striking Displays Arouse Interest in Reducing Forest Fires

FRANKLIN, MASS.—The Fire Department of Franklin took advantage of the Labor Day parade to give an exhibit of forest fire prevention, which has already had excellent results.

Five hundred four-year-old transplants, furnished by the State Forestry Department, were used in floats mounted on trucks in the parade, accompanied by appropriate signs. One of the photographs taken at the time is reproduced herewith. Later, the transplants were given out to school children for home planting.

The Labor Day exhibit was followed with a striking window display of autumn foliage and game, in connection with the Fire Pre-

vention Day movement. These two exhibits aroused public interest and have made people more willing to comply with state fire prevention laws relating to forest fires.

The effect of the displays is already apparent. Throughout the spring fire season the department responded to more than fifty alarms of forest fires; during the fall, when conditions were more favorable for wood and brush fires, only four alarms were turned in.

ERNEST L. METCALF,
Chief, Fire Department.



FROM THE FRANKLIN, MASS., FIRE PREVENTION PARADE

Losses Changed to Profits

The Story of the Miami, Oklahoma, Electric Light and Power Plant and Water-Works

THE success of the municipal light, water and power system at Miami, Okla., during the last few years proves that the application of sound business principles and keen judgment in the selection of equipment can make a municipal power-plant a paying investment and an asset to a community. Location is the fundamental physical factor in the growth of a town. The town of Miami, Okla., is indebted to its founders for selecting a location rich in products of the soil, both mineral and agri-

power-plant, and bonds were issued to finance the project. As the old plant was located on valuable property in the business district where there was no room for expansion, it was found advisable to look around for a more suitable location, and a site on the southern outskirts of the city was selected for the new plant.

Because of the unfortunate experience with steam equipment, the decision was made to install power machinery of the oil-burning type. A careful comparison of the



EXTERIOR OF MIAMI, OKLA., WATER-WORKS, SHOWING BASIN AND POWER-PLANT

cultural. Situated in the fertile Neosho Valley, Miami lies in the heart of the Tri-State zinc belt, and while the adverse effect of the present inactivity in the zinc industry has been felt, agriculture has sustained the town's rate of growth to a great extent.

Even with its natural advantage, Miami in 1918 found itself confronted with a shortage of light, power and water, a predicament typical of many towns of 5,000 people or less. The municipally owned power-plant had greatly deteriorated. One Corliss engine, powered by four horizontal tubular boilers, could not keep up with the increasing demand for electric current, and the town had outgrown its water-supply. The plant was losing money all the time, and something had to be done at once to insure a permanent sufficient supply of light and water.

It was decided to install a complete new

various types of oil engines, with respect to labor, maintenance, fuel economy, and operating advantages, resulted in the selection of the full Diesel type oil engine invented by Dr. Rudolph Diesel in 1898. Great pains were taken to investigate the various makes of Diesel engines, and the Commissioners visited a number of plants where units of the full Diesel type were operating. As the outcome of this inspection tour, the city of Miami placed a contract for a vertical, four-cycle, four-cylinder Fulton-Diesel engine developing 500 b. h. p. at 150 r. p. m. arranged for direct connection to a 425-kv.-amp., 2,400-volt, 3-phase, 60-cycle, alternating-current Westinghouse generator and exciter.

In the meantime, work proceeded on the power-house itself, and when the Diesel engine was delivered, in the spring of 1919, a well-lighted and ventilated concrete building of the one-story type had been erected,

and provided with a Whiting crane of sufficient capacity to handle the heaviest part of the machinery.

The steam-driven water-works pump was replaced by an air-lift system operated by a motor-driven 20 x 12 x 14-inch Sullivan angle compound compressor with a capacity of 1,094 cubic feet per minute. The water, which requires no treatment, is obtained from three artesian wells and delivered by the air-lift system to a duplex reservoir of solid concrete with a capacity of one million gallons. As shown in the photograph reproduced herewith, the reservoir is advantageously located next to the power-plant. The water is forced into the city mains by a Manistee motor-driven centrifugal pump which has a capacity of 500 gallons per minute against a 150-foot head at 1,750 r. p. m.

To insure a permanent supply of fuel oil, a concrete well of 20,000 gallons capacity was built immediately adjacent to the power-house. Oil is piped direct from tank cars into this reservoir by gravity, thereby effecting savings in time and labor.

Since the new plant began operating, there has never been a month in which the Light and Water Department failed to show a profit, but the old steam station continued to burden the town, because, in order to give uninterrupted service, it was necessary to operate the steam plant at intervals when the Diesel unit was shut down for cleaning and adjustment. For example, in 1920 it cost the city over \$16,000 to operate the steam plant merely as a standby, whereas the Diesel engine operated 95 per cent of the time for about \$22,000. To overcome this condition and obtain a perfectly balanced plant, Miami purchased and installed in June, 1921, a second Diesel set consisting of a Fulton four-cylinder engine developing 585 b. h. p. at 180 r. p. m., direct-connected to a Westinghouse 500-kv.-amp., 2,400-volt, 3-phase, 60-cycle, alternating-current generator with exciter. With this equipment, the Water and Light Department is always in a position to handle the peak load, and each engine is kept in perfect operating condition without working any hardships on the employees at the power-house.

Additional mechanical equipment was installed, including a Gould triplex 10 x 12-inch fire pump, driven by a Westinghouse 50-h. p. motor. This pump, in case of

emergency, will force water through the city mains at a pressure of 110 pounds per square inch, and there is small danger that Miami will ever have a fire beyond the control of the Fire Department. The air-lift system was also supplemented by a second Sullivan pump with cylinders 17 x 9 $\frac{3}{4}$ x 12 inches, driven by a 150-h. p. motor.

Rates for Light, Power and Water

The great economy and low maintenance and attendance cost of the new station have enabled Miami to supply its citizens with light, power and water at very reasonable rates; 50 cents is the minimum charge per month for light and water, and \$1 is the minimum charge for power. Where consumption exceeds the minimum, the following rates apply:

LIGHT

24 kilowatt hours or less,	10 cents per kilowatt
26 to 50 kilowatt hours,	9 cents per kilowatt
50 to 75 kilowatt hours,	8 cents per kilowatt
75 to 100 kilowatt hours,	7 cents per kilowatt
100 to 200 kilowatt hours,	6 cents per kilowatt
200 kilowatt hours or more,	5 cents per kilowatt

WATER

2,000 gallons or less,	50 cents per 1,000 gallons
2,000 to 5,000 gallons,	45 cents per 1,000 gallons
5,000 to 10,000 gallons,	40 cents per 1,000 gallons
10,000 to 60,000 gallons,	30 cents per 1,000 gallons
60,000 to 100,000 gallons,	25 cents per 1,000 gallons
100,000 gallons or more,	22 $\frac{1}{2}$ cents per 1,000 gallons

POWER

Flat rate of 3 cents per kilowatt with no connected load charge

In explanation of the above, it should be stated that where step-down rates apply, the charge to the consumer is based on two or more rates according to the quantity of current or water used. For example, if 10,000 gallons of water are consumed, the consumer actually pays three rates: 50 cents each for 2,000 gallons; 45 cents each for 3,000 gallons; and 40 cents each for 5,000 gallons. An important point to remember in this connection is the fact that there is no reason why Miami should not enjoy these rates for many years to come. With reasonable care and attention, the Diesel engines will sustain their original high efficiency indefinitely, and the use of removable liners, shells and bushings permits the replacement of worn parts at the least possible expense.

Bookkeeping

The system of bookkeeping and accounting which the Miami Light and Water Department uses would do credit to many a large city. Previous to 1919 large ledgers were used, but these have now been replaced

entirely by cards, and the mere fact that two men now do the work, whereas five men were employed to handle the ledgers, is convincing evidence that the card system is by all odds the best. White, blue and yellow cards, measuring 8 x 5 inches, are used respectively for water, light and power accounts, and each card is ruled for entries covering a period of one year. Every consumer is given a number, and both the name and the number are printed on his cards. The cards are then filed numerically, and the names are listed alphabetically in one

50,000 gallons. This positively eliminates all possibility of an error in the calculation, and the amount shown on the coupon must always check with the statement. These monthly statement cards are run through an addressograph, which prints the name of the consumer and his file number on each card. When payment is received, it is only necessary to pick out from the account card file the card of the color and number corresponding to the coupon. One tremendous advantage of this system lies in the fact that the Light and Water Department al-



INTERIOR VIEW OF POWER-PLANT, SHOWING INSTALLATION OF DIESEL ENGINES

ledger. Thus, if the consumer loses his statement, it is possible to find the number by referring to the alphabetical index.

Monthly statements are also issued on white, blue and yellow cards, post-card size. The last reading, present reading and the amount consumed are entered on the left side, and the month is stamped at the bottom. The right side of the card is used as a coupon to be detached and presented at payment. A rubber stamp, bearing in duplicate the gross amount, discount, and net charge, prints these items on both the statement proper and the coupon. Two sets of these stamps cover all consumption of light and water up to 100 kilowatts and

ways knows exactly where it stands on collections.

Each day all the account cards covering the bills paid that date are filed together, and after collections are closed for the day the coupons are checked against the receipts. The account cards, coupons and cash are right there together where they can be referred to instantly, and any discrepancy which appears may be quickly discovered. The advantage over the ledger system in this feature is obvious. After the daily account is balanced, the paid-up account cards are filed separately, and those showing accounts not paid in full are returned to the main file. Thus, it will be

seen, all account cards remaining in the main file on the 15th of the month cover delinquent accounts.

As stated before, previous to the installation of the first Diesel engine, the Water and Light Department was losing money; in fact, each year a tax was levied to meet the current expenses of the system. Now, on the contrary, net collections over and above all operating expenses are about three thousand dollars a month. Below is given

Total kw. hours generated.....	2,176,400
Total number of hours in operation.....	8,344
Load factor for entire year.....	78.2%

	Gallons	Cost	Cents per Kw. Hr.
Fuel oil	177,150.54	\$10,907.58	.50117
One gallon of fuel oil served....		12.285 kw. hours	
Assuming that one kw. = 1.5 h. p.,		5.42 gallons	
of fuel oil served 100 h. p. hours.			

the total cost of fuel oil covering the

year ending January 31, 1921, when the first Diesel engine operated, with the old steam plant as standby equipment.

Before closing, due credit should be given to those who were charged with the responsibility of rejuvenating Miami's light, power and water system, for their foresight and broad grasp of the problems which confronted them. Where power is the sole product, the cost of power becomes the total cost of production, and the success of the central station is measured by its operating expenses. Realizing that fact, the officials of Miami, with unwavering purpose and astonishing technical insight, have placed their power-plant on a plane with the largest central stations in the United States with respect to economy, efficiency and reliability.

Collections of Pictures for Schools and Libraries

COLOR prints and photographs of famous pictures suitable for decoration of schools and libraries have been brought together by The American Federation of Arts. There are included fine reproductions of works by Inness, Thayer, Millet, St. Gaudens, Blakelock, Abbey, Violet Oakley, Couse, Brush, Whistler, Homer and others, as well as examples from older masters such as Reynolds, Van Dyck, Rembrandt, Rubens, Raphael, Giorgione, and Titian. The prints vary in size and color, but all are of such dimensions and character as to lend themselves readily to schoolroom or library use. There is Reynolds' "Age of Innocence," then Blakelock's "Moonlight," or Winslow Homer's "Northeastern." There is in these prints admirable material to constitute the background of growing youth and to aid in formulating those ideals and ambitions which it is the work of schools and libraries to foster, while at the same time bringing into the life of youth a foretaste of that shadowy thing which is called culture.

The circulation of the traveling exhibitions is an important part of the work of the Federation in extending the knowledge of art in all parts of the country. Art opportunities need no longer be localized. The exhibitions are circulated from coast to coast. And it is to be noted that the Federa-

tion reports applications for exhibitions this year from forty out of forty-eight states. There are over fifty exhibitions, leaving a wide latitude of choice for taste and interest. The groups cover all manner of contemporary expression and production on the subjects offered. Collections of contemporary American painters, a special group of painters of the West, a group from the National Academy of Design exhibition, pictures of children, miniatures, and small bronzes are among the collections of the fine arts offered. A number of exhibitions of prints are also listed, comprising etchings, drypoints, aquatints by leading contemporary American etchers, as well as a group from the English Print Society. The work of illustrators is also available. Among the industrial art exhibitions assembled one finds collections of textiles, wall paper, a printing exhibition, and one of Italian handicrafts. They serve the double purpose of encouraging production of a fine type and developing knowledge among home-furnishers. For, aside from the pleasure and interest afforded, the exhibitions make possible the cultivation of art appreciation and good taste at first hand.

Further information may be obtained from Miss Leila Mechlin, Secretary, American Federation of Arts, 1741 New York Avenue, Washington, D. C.

Financing and Installing a New Street Lighting System

By P. B. Reed
Street Lighting Specialist

EVEN in these days, when so many cities and towns are realizing the necessity of better street illumination and are installing new and improved types of lamps and standards in large numbers, the discarding of its entire street lighting system by a municipality and replacing it with a new one is sufficiently interesting to make it worthy of remark. The city of Mandan, N. Dak., which has a population of about 4,600, has done so; and, as there are 447 ornamental lighting standards in

In the business district G. E. Form 9 Novalux units, with diffusing globe, glass canopy, and series film socket, are used; in the residential sections, Form 8 is employed, the equipment being similar to that used in the business district. Ten and one-half-foot ornamental iron standards and 100-candle-power lamps are used in the residential sections, and 12-foot standards and 250-candle-power lamps in the business district. It was originally intended to use a 400-candle-power lamp in the business district, but it



LIGHTING UNITS ON RESIDENTIAL STREET, MANDAN, N. DAK.

use, the city has attained the distinction of having approximately one standard to every ten inhabitants.

For a number of years the streets of Mandan were lighted by fifty arc lamps. These have been removed, and replaced by a system that is coming into very general favor—Mazda lamps enclosed in ornamental globes supported by ornamental iron posts. The change has been made at a cost of less than \$100,000, and the gain in the appearance of the city and in the efficiency of its street lighting has been noticeable and gratifying.

was decided to employ those of 250-candle-power, which proved to be ample. The standards, which were made by the King Manufacturing Company, are uniform in design in both the business section and the residential districts, and are of graceful and pleasing pattern. The system is arranged and operated in four circuits, that of the business district being separate from those of the residential sections, and in each case the corner lights are on a different circuit from that of the intermediate lights.

The installation was designed by Black & Griffin, consulting engineers, of Mandan,

and the contract was let, under competitive bids on plans and specifications prepared by them, to M. S. Hyland of Fargo, N. Dak. The type of standards used was selected by the City Commission.

The breakage of lamps, globes and canopies has been very small, from December 20 to June 16 as follows:

MONTH	Lamps	Globes	Canopies
December	12	1	1
January	22	1	1
February	32	6	6
March	16	1	1
April	13	2	2
May	31	2	2
June	13	1	1
Total	139	14	14

Mandan has about 9½ miles of street lighting and approximately 3½ miles of paved streets. A number of standards were, of course, installed along unpaved streets. In these cases the posts were placed on the curb line at what will be the grade and street line when the street is paved, and 6-foot sections of curb were set in for protection. All the cable was laid 12 inches below the paving grade on unpaved streets, just under the edge of the sidewalk where the sidewalk extended to the curb, and across streets at right angles to the center of the street in 2-inch iron conduit pipes. All pipes crossing paved streets were pushed across, and no pavement was cut. It is interesting to note that in making the installation, approximately two car-loads of cement, 1,200 cubic yards of concrete, and 140,000 feet of No. 8 single conductor cable were used.

All the lamps are operated until 9:30 P. M. The corner lights are then turned out, and only the intermediate lamps are burned until morning, except on Saturday nights and special occasions, when the entire system is operated. The cost of maintenance and operation is paid out of the general fund for street lighting made by the

usual levy. Power for operating the system is supplied by the Mandan Electric Company, a privately owned corporation, but the city installed and owns the switch-board panels, meters, etc. The lights are controlled by employees of the company under the direction of the City Commission. The rate paid is 5 cents per kilowatt hour.

The lighting schedule and the consumption of current for the first half of the year were as follows:

	Kw. Hr.
January—5:00 P. M. to 7:00 A. M.....	11,750
February—5:30 P. M. to 6:20 A. M.....	10,080
March—6:00 P. M. to 5:00 A. M.....	8,540
April—6:30 P. M. to 4:00 A. M.....	7,470
May—7:00 P. M. to 3:00 A. M.....	5,500
June—8:00 P. M. to 2:40 A. M.....	5,400

The job was divided into three contracts, other districts petitioning for the improvement after the first contract was under way. The total of the three was \$95,721.84, including engineering, assessing, and advertising as required by the laws of the state. The cost of the installations was met by special assessment against the property directly benefited. It was then decided by the special assessment commission that all lots were equally benefited whether or not there was a light directly in front of the lot or opposite, provided they were equally spaced on the street around the entire block. The cost per lot was higher on the last two contracts let, and the average for a 50 x 140-foot lot in the residential section on the main contract was \$90.16, and on a 25 x 140-foot business lot, \$48.63, these costs being based on cash payment. The assessment was spread over a period of five years, and warrants were issued bearing interest at 6 per cent. In the residential section the assessment commission held that a corner lot received no more benefit than an inside lot, even though there might be lights on the side; but in the business district the corner lots stood the cost of the light on both sides.

Your Neighbor's Yard

Proper disposal of our waste materials will reduce fly incidence, and hence reduce the prevalence of diseases and increase public health. On the other hand, improper and incomplete waste disposal increases the number of flies, increases the danger from disease, increases the incidence of diseases, lowers the public health, favors the spread of epidemics, and increases the death-rate.

If you value the lives of your own family and your own friends, you will take proper care of the health of the poorest and most illiterate of your neighbors, and will insist that his premises be as free of dangerous waste materials as you keep your own.

If you let your neighbor have filthy premises, you may pay for it by death and disease in your own family.

Plan for Promotion of Municipal Skating

By Bobby McLean

Former Champion Speed Skater of the World

THERE is opportunity in many towns to render a community service by putting forward a plan to provide safe and convenient public skating places for the boys and girls and their older brothers and sisters. This is not a new idea, but has already been carried out in many towns and cities and will be found practical in any place where ice forms during the cold season. The time and attention necessary to insure the success of such a project will be slight in proportion to the returns and satisfaction achieved.

Boston, Mass., has eighteen municipal rinks when the weather is cold enough, and some of these rinks are large enough to accommodate thousands of skaters. These are not the only skating places in Boston, but the ones that the city takes charge of. Springfield, Mass., has twenty municipal skating-rinks under the direction of the School Board and the Park Commission. Pittsburgh, Pa., utilizes its playgrounds as skating centers, as do St. Louis, Mo., Worcester, Mass., Columbus, Cleveland and Cincinnati, Ohio, Baltimore, Md., Lakewood, N. J., Minneapolis, Minn., Milwaukee, Wis., Salt Lake City, Utah, Chicago, Ill., and these places in New York State: Waterford, Albany, Cohoes, Troy, Rochester, Buffalo, Brooklyn, Plattsburgh, Green Island, Watervliet, Rensselaer and Batavia.

Chicago has the greatest number of free skating-rinks. The city has flooded 70 playgrounds and 329 vacant lots—399 skating places. It is safe to say that in and around Chicago there are 600 open-air skating-rinks. Quite naturally, Chicago develops more skaters than any other city. The city gives a trophy for competitions in each of these rinks, encourages dual club meets, and winds up with a race for the championship of Chicago in which the best skater of every district, selected by elimination contests, participates. One race in Chicago last year had 452 entries.

It is estimated that 30,000 persons skate on the Buffalo municipal skating ponds daily, and in quite a number of cities, we believe, the figures are higher than this. Minneapolis has a number of rinks for the smaller

children, and Milwaukee has a hockey league playing on the larger rinks.

The skating-rink at Plattsburgh, N. Y., promoted by the Chamber of Commerce, was described on page 407 of *THE AMERICAN CITY* for November, 1921.

Skating was held back for years through the scarcity of indoor rinks, but with municipal rinks outdoors the sport can be developed to its fullest extent and at the same time provide healthful recreation for many. It is the greatest of outdoor winter sports.

Some One Person Must Start It

It is necessary for some live individual to take hold of this municipal plan to put it over. Although not absolutely essential, it is well to organize a committee of interested citizens to work in making the plan a success. If the live wire can interest some well-known civic or athletic organization, he can choose his committee from its members and thus lend prestige to the idea. After choosing the committee, the first step in promoting municipal skating is to make a survey of the town and determine the park locations and other places suitable for flooding and turning into skating-rinks for the children. These locations should be as near the center of the town as possible. A location near a schoolhouse will give the children plenty of opportunity to skate after hours. In addition to parks and playgrounds, one can usually find vacant lots of suitable size which the owners will gladly allow to be used for this purpose. Tennis courts are especially desirable, as they have a clay foundation and are easily flooded.

The next step is to take the matter up with the mayor or chief executive of the town. It is best to present the proposition to him verbally and suggest the locations you have selected as desirable for flooding. You can later confirm your statements by a letter outlining the entire plan. This he will use in presenting the proposition to other municipal officials who are interested. Point out to him what has already been done in some places, the benefits to be derived, and the necessity for providing safe and convenient skating-rinks for the young people



THE PUBLIC SKATING RINK AT PLATTSBURGH, N. Y.

This rink, on the athletic field of the High School, was promoted by the Chamber of Commerce

of your town. Suggest that he submit a plan to the city council to provide the necessary means for preparing and flooding parks, playgrounds, and other vacant areas and keeping them in condition for skating. This can ordinarily be taken care of by the local fire or public works department. The governing body of the town usually is willing to cooperate with the chief executive on a proposition of this kind, because it does not require a large outlay of money and at the same time gives the members an opportunity to show that they are taking an interest in the welfare of the public.

The matter may be helped along by interviewing various members of the city or town council whom you know personally, and gaining their approval before the matter is brought up to them by the mayor. In a great many cases it is unnecessary for the council to act. Sometimes a letter from the mayor to the commissioners of each park board and the fire commission will be sufficient to accomplish the desired result.

Publicity Through the Press

The newspapers are always willing to cooperate on a proposition of this nature, and there is no better way of creating public sentiment. Before taking the matter up with the mayor, it is advisable to have the newspapers print an article advocating the plan, in order to create advance interest. It is also well to forward to the newspapers a

copy of your letter to the mayor and the mayor's letter to the park commissioners.

As soon as the initial steps have been taken and several parks or playgrounds have been flooded, an effort should be made to provide the proper supervision over them. The supervisor should be the athletic director of schools or some capable boy leader who will arrange the sports program and look after the general interest of the skaters. He should have a corps of assistants who will each have supervision over one or more rinks. Volunteers can usually be obtained for this work, to serve for a few hours each day or week.

Skating contests should be provided, also hockey games, fancy skating events, and instruction for those who are learning to skate. Hockey players should not be allowed to interfere with the other skaters; where possible, special rinks should be provided for this particular sport. A local championship contest is a feature that creates much interest. Merchants about town are usually willing to donate certain articles as prizes for skating events. These need not be expensive. Skating medals can be purchased at a low figure for adult events, and ribbons can be used for the children's events. Contests can be staged between wards or sections of the town, and at the end of the season a carnival can be held at which the city championship will be determined.

Handling Liquid Chlorine

Suggestions and Cautions for Water-Works Operators

By D. K. Bartlett

CHLORINE in liquid form has now been used in this country since 1907.

As in the case of other compressed gases, there are very definite and careful regulations drawn by the Interstate Commerce Commission governing its transportation. Under these regulations there are four accepted containers in which the material may be moved, namely, those which carry 100 pounds, 150 pounds, 2,000 pounds, and 30,000 pounds. As there have been no accidents in interstate commerce since the regulations have been in force, it seems proper to assume that the regulations are right, as they now stand.

The use of chlorine has become very wide-spread through the textile industry, the public water-supply system, the flour industry, the chemical industry, and the pulp and paper industry. Liquid chlorine is today stored at from 4,000 to 5,000 different points in quantities of from a few cylinders to many thousand pounds. So far, such regulations covering storage as have been in force are simply those recommended by the producer to the consumer. Safety is of prime importance to the producer as well as the consumer, and while the hazard is much less than is commonly supposed, it is, nevertheless, sufficient to cause the producers to adhere to and recommend regulations which make the use of this material safe.

It may be well at this point to consider briefly the hazards of compressed gases in general.

As long as the gas remains in the container, it is obvious that it can do no harm, irrespective of its effect when released. It is therefore necessary to consider the probability of escape of gas from the container, as well as the qualities of the gas itself. An escape of gas from a container may be due to—

- A. A true explosion
- B. An increase of pressure, due to heat, sufficient to rupture the container
- C. Leaks

If the gas escapes from the container, the resulting hazard may be due to—

1. Inflammability
2. Poisonous effects
3. Irritating effects, with interference with sight or respiration

Considering now the specific case of chlorine, we can eliminate "A," since it is non-explosive. The chance of a rupture due to "B" is very slight on account of the high critical temperature of chlorine. The following table gives this temperature for a number of common gases:

Chlorine	146
Ammonia	132
Acetylene	36.5
Nitrous oxide	36.5
Carbon dioxide	31
Oxygen	-118
Hydrogen	-240

By Interstate Commerce Commission regulations all cylinders and ton drums are provided with fusible plugs which melt at 158 degrees Fahrenheit, at which temperature the pressure is about half the test pressure of ton drums at time of manufacture and a quarter of the test pressure of the smaller cylinders.

There has never been an instance of bursting of a container in transit, or in a user's plant.

There have been four or five cases of the rupture of containers in the manufacturer's plant due to the presence of foreign material in the container which reacted with the chlorine. To guard against a repetition of such accidents, all manufacturers now have in force a rigid system of inspection of empty containers. Even should a container with such foreign material be filled, any trouble resulting will necessarily develop within a few hours, so that any hazard existing from this cause concerns only the manufacturer—not the user or the carrier.

There have also been a few cases of fire where a large quantity of chlorine has been stored. In each case the upward draft due to the heat of conflagration has been strong enough to carry the gas upward and cause

a sufficient dilution so that the fire-fighters experienced no inconvenience in their work.

This brings us to leaks. Here the evil smell of chlorine is its greatest safety factor. Its presence in the atmosphere can be detected in very minute quantities through the sense of smell. After the person in charge of the use of the chlorine in any plant has had his first considerable whiff, he is quite ready—from then on—to exercise reasonable care, take necessary precautions, and follow the instructions laid down by the manufacturer.

The next safety factor is the slow absorption of the heat necessary to evaporate the liquid into a gas. The following table gives the rise of temperature of the liquid chlorine in a tank car during a period of 96 hours:

Time (Start)	Temp. Contents	Change During Period	Pressure (64 lbs.)	Change During Period
End 24 hrs.	-9 deg. C.	—	—	—
End 48 hrs.	-2 deg. C.	7 deg. C.	76 lbs.	12 lbs.
End 74 hrs.	+3.5 deg. C.	5.5 deg. C.	88 lbs.	12 lbs.
End 96 hrs.	+6 deg. C.	2.5 deg. C.	93 lbs.	5 lbs.
	+8.5 deg. C.	2.5 deg. C.	98 lbs.	5 lbs.

When the odor of chlorine is noticed, the source should immediately be located. Never hunt a leak through the sense of smell. Always have a gas mask handy and be sure you have fresh canisters. The mask is not apt to be used, but it gives confidence to the one hunting the leak. Have a bottle of aqua ammonia and a piece of waste fastened to the end of a short stick. Dip the waste into the ammonia and start your search. The moment you come to chlorine in the air, a white fume of ammonium chloride will appear. As you reach a denser volume of chlorine, the white fumes are denser. Thus the leak is quickly located. If this leak is in the piping, etc., shut off the valves at the containers and repair. If in a valve on the

container or the container itself, and it cannot be stopped, connect the gas valve from the container to your absorption system and begin to operate. The liquid cannot evaporate in the containers, without the application of heat, as fast as the gas is absorbed in your system, and thus the leak quickly stops.

As to the properties of chlorine, it is non-inflammable, and not poisonous in the sense that carbon monoxide or phosgene, for instance, is poisonous. We can therefore eliminate Nos. 1 and 2, and confine ourselves to No. 3.

The immediate result of inhaling a large quantity of chlorine gas is the inflammation of the tissues lining the throat, with resulting coughing and nausea. While it is highly irritating and extremely uncomfortable, it is never fatal—unless the subject remains for a considerable period in an atmosphere of highly concentrated gas.

Should a person be affected by chlorine gas we recommend the following treatment: Remove at once to the open air and away from all gas fumes. Place the patient flat on his back with head slightly elevated, and give a half-teaspoonful of essence of peppermint, or a moderate dose of bromo seltzer or whiskey. This will relieve the tendency to cough and soothe the inflamed membranes, allowing the passage of air and promoting the action of the respiratory organs. The person affected should himself resist as much as possible the impulse to cough. A mustard plaster on the chest will give prompt relief. While there are never any serious after-effects, a physician should always be called.

ACKNOWLEDGMENT.—From a paper read before the National Safety Council Congress, Boston, Mass.

Street Cleaning Troubles in New York City in 1770

That municipalities had their street-cleaning troubles in the very early days is indicated by the following item which appeared in the *New York Gazette*, a little newspaper of 200 years ago:

"The Assistant Aldermen of the different wards were instructed to call on the several inhabitants in their respective wards and ascertain what they are willing to pay toward cleaning the streets and carrying away the dirt; but

this method not meeting with a proper response on the part of the inhabitants, an order was made that the inhabitants of the city on every Friday sweep the dirt in heaps before their premises in order that it may be carted away on Saturday by the city cartmen. To compensate the latter the inhabitants were ordered to pay them for every load threepence if loaded by the inhabitants themselves. The only street cleaned at public expense is Broad street. A public scavenger is appointed for this purpose, who receives a salary of \$40 per annum.

Child Health and the Public Schools

By Julius Kuhnert

Director of Physical Education, Public Schools, Raton, N. Mex.

IT has been fully demonstrated that school progress and contentment rest largely upon health. Many states have compulsory medical inspection laws for school children which require not only a school physician but also a school nurse.

Before a child begins school he leads a comparatively free life. He is out of doors playing and developing physically. When he enters school, this is all changed, because the modern school requires that freedom be restricted. In most cases children are required to sit for long periods with two sessions per day. This, as authorities tell us, is detrimental to the normal activity of the heart and lungs and must result in an impoverished state of the blood. A child stunted at this time by lack of physical activity and hygienic habits will be stunted for life.

Parents, as well as teachers, must study that great branch of medicine, hygiene, which is often termed preventive medicine. Hygiene seeks to preserve health—in other words, to prevent disease—through obedience to laws of health. The child, unaided, cannot understand these laws, and he must have the wise counsel of his parents, teacher, nurse, and physician.

Schools Should Be Sanitary

One of the greatest duties of the teacher is to seek and maintain sanitary conditions in her room, school and grounds. This is not only for the child's benefit, but also for her own. In a recent survey made in the schools of an eastern state the following conditions were revealed: 66.2 per cent of the 2,169 teachers questioned reported insanitary conditions in the schools. Of this number, 46.7 per cent reported defective ventilation; 41.6 per cent reported insufficient toilet facilities; 35.9 per cent reported dust in the room from dirty blackboards; 28.3 per cent reported lack of drinking water dispensed in a sanitary way. Many other insanitary conditions were reported in smaller percentages. Such conditions are far more responsible for the poor health of children and the transmission of disease

than any other cause. Everyone recognizes the fact that the common drinking cup and towel are dangerous; dirty toilets are the breeding-places of disease; and a poorly ventilated room saps the life, energy and vitality of the child, hindering his school progress and breaking down his resistance to disease.

In "Health and the School," by Burke, it is stated that 60 per cent of the school children in the United States are suffering from defects which are remedial and which retard the school progress of the children 9 per cent. Some authorities estimate that as many as three out of every four children are suffering from physical defects which might be prevented or corrected. Assuming that the approximate cost of education in 1915 was \$600,000,000, and that, as Burke states, "60 per cent of the school children are retarded 9 per cent," it costs approximately \$32,000,000 per year for this retardation. Dr. Ayers also points out that it is cheaper to keep the children repeating in the lower grades than in the higher grades. Dr. McCurdy states that 85 per cent of the defects of school children are remedial: i. e., carious teeth, diseased tonsils, adenoids, defective vision, deficient musculature, and malnutrition.

Postural defects in school children are caused by weak musculature, poor hygiene in the home, defective vision, bad air in the home and the school, general lack of exercise, and long-continued periods of flexion, that is, reading with the head and shoulders tipped forward. Underweight may be caused by the same conditions, including also carious teeth, diseased tonsils, adenoids, and any curvature, which is nothing more than a postural defect. In practically every case, deficient musculature is caused directly or indirectly by underweight or malnutrition.

A System of Health Instruction

In order that school may be a decisive factor in improving the race and lowering the great percentage of physical defectives, a comprehensive system of health instruction, combined with physical activity, should



A SCENE IN THE ITHACA, N. Y., PUBLIC SCHOOLS' MEDICAL OFFICE

Such clinics can render invaluable service in detecting defects in their early stages and preventing the disastrous consequences of neglect

be instituted in all schools. This health instruction should include, as Dr. McCurdy states in "Physical Education and National Efficiency," the "knowledge of the elementary problems which concern health, i. e., diet, care of the teeth, bathing, sex, exercise, and the general conditions related to health: for example, room temperature, ventilation, dust, school seating, posture; also the public health problems like sewage disposal, milk and water supplies and the general control of infectious diseases."*

Malnutrition and postural defects among school children should be taken care of at once. A malnourished child is always an underweight child and one who suffers more from postural defects and is more susceptible to diseases than the normal child. Underweight in a child is a serious matter, and many parents and teachers do not understand that this condition is often described by such terms as "frail," "no appetite," "run down," "low vitality," "skinny," "not himself," "nervous," "easily upset," "growing too fast," "always tired." Malnutrition and postural defects are remedial. The essential thing is to place the child under a strict hygienic régime, both at home and in the school. In these cases the teacher holds a very important place, because she is largely instrumental in molding the school and after-school life of the child.

It is absolutely essential that all children suffering from any serious physical defect should have medical attention. The one great group of children that should be given first attention is the malnourished group. Malnutrition is a definite departure from health and should be recognized as a disease. It has certain causes and there are certain after-effects. Some of these after-effects can never be entirely overcome, because a malnourished child is never as strong and capable as though he were normal. These children are often pale and anemic, inattentive, listless in their studies, and do not care to run and play. Mental and physical work easily fatigues them and they are often retarded in school. The attempt to educate the malnourished child often results in the waste of time and money by the teacher and the school board, and there is failure and discouragement on the part of the child who cannot keep up with his mates.

Remove the Causes of Malnutrition

Some of the causes of malnutrition are poverty, overcrowding, bad home habits, faulty school hygiene and disease. The cause of malnutrition in each child should be sought, and removed by medical attention and education in hygienic living, especially with regard to food and correct food habits. Every remedial defect should be removed. A child suffering with enlarged adenoids

* *American Physical Education Review*, December, 1919.

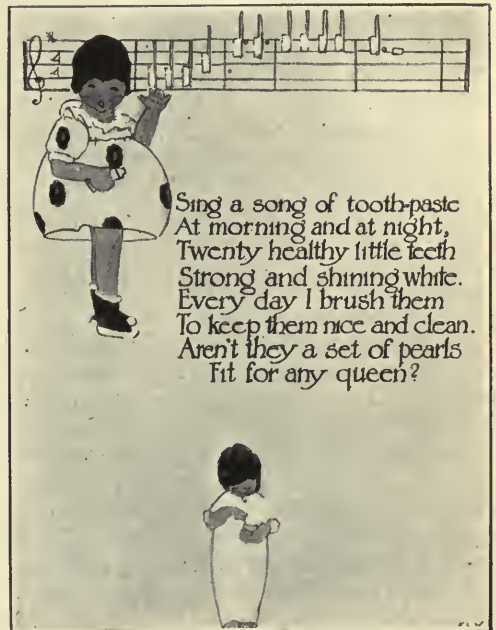
cannot breathe through his nose and it is useless to tell him to do so; the adenoids should be removed. A child with carious teeth cannot masticate his food; his teeth defects must be corrected first. Eyestrain often causes nausea and loss of appetite, resulting in malnutrition. The physical condition of the child is also affected by lack of fresh air while sleeping and exercising, lack of cleanliness and proper clothing, fast eating, indulgence in candy and sweets between meals, and the constant drinking of tea and coffee. The teacher can do a great deal to correct these conditions, but the home must assist and cooperate.

Spinal curvature and postural defects are often the direct results of malnutrition, which in many cases is due to improper care and feeding in the first years of life. Deformities of the bones, such as pigeon-breast, bow-legs, knock-knees, weak and flat feet, are often the results of rickets, a disease of poor nutrition and hygiene. In an investigation of 717 cripples under sixteen years of age, 10 per cent of the deformities were found to be due to rickets. In an investigation of 22,000 school children in London, 2 per cent showed some eye disease, three-fourths of which was due to unwashed faces and dirty hands. Fifteen per cent of all eye troubles of school children are due to a disease of the eyelids and the cornea which is often the cause of a great deal of blindness. This disease is often found among malnourished children. Eighty-four per cent of blindness in children is caused by ophthalmia neonatorum, which can be practically eliminated by proper child hygiene and medical inspection.

Effective child hygiene includes all activities that are necessary for the protection of the life and happiness of the child. All agencies that deal with the mental and physical well-being of the child must cooperate. Conditions which require doctors, clinics, medicine, crutches and braces should not be tolerated when right living and healthful environment can prevent their need. It is not economy to spend money for the treatment of the few when the same amount of money will maintain the health of the many. Nor is it wise to spend money for the discovery of the defects of school children when these defects can be prevented by proper hygienic conditions.

The greatest concern of every parent and teacher should be to see that the child has the proper size seat in school, that there is plenty of fresh air, and that all conditions surrounding the child are as perfect as they can be made. Parents should consult with the teachers in regard to the health conditions of their children, and both should cooperate to make the school a healthy place for the child to be in. The board of education must also cooperate in changing the seating, ventilation system and toilet facilities, if necessary, to make the school a healthful place for the children.

Every school system should have a paid school nurse who can look after the health of the children, not only in the school but also in the home. Parents respect the knowledge of an experienced nurse and will often assist her as well as teachers in relieving unhygienic conditions. A nurse can find many abnormal conditions in children which parents do not think exist, because the child acts normal in every way. The nurse and the doctor are the important links between the physical fitness of the child and his mentality, and their importance should be recognized by the community and the school board.



Courtesy National Child Welfare Association.

A Fair Wage Versus a Chance Wage

An Analysis of Salaries in the County Institutions of a Mid-Western State

By William E. Mosher

Of the National Institute of Public Administration

EDITORIAL NOTE.—The following is an analysis of the wage scale paid the employees in the county homes of one of our most prosperous states. A similar analysis might be made of the wages received by the mixed group of workers in the employment of any one of a large number of counties and municipalities. The factors that go to determine a *fair wage policy* as outlined in the latter part of this analysis are equally significant for the city, county or state that aims to maintain a more or less permanent and efficient working force. In the name of good business administration it is now necessary for any employer, whether public or private, to give intelligent consideration to so vital a matter as his wage policy.

A PLACARD posted on the bulletin board in the main building of the Post Office Department in Washington makes the striking announcement that the Postmaster General is going to take the 300,000 postal workers into partnership with him, and in support of this policy asserts that "labor is not a commodity, because that idea was abandoned 1921 years ago."

A careful survey was made in 1919 of the salary conditions of the 90,000-odd workers in Washington. It went to prove that 28,000 were receiving less than \$3 per day, which was considered at that time to be a minimum wage. In spite of the facts brought out by this survey, Congress did not then, and has not yet, seen fit to take action as to this important matter. As a matter of principle, the Government may subscribe to the doctrine that labor is not a commodity; as a matter of practice, it is a long way from adopting it.

The Government Policy of Drift

The Federal Government typifies on a large scale what has been happening in smaller governmental units all over the country. Like the great body of private employers, our local governments have no wage policy. To them, labor is still a commodity. They pay what they have to. If the workers are unorganized and if there are no means of bringing pressure to bear on the government-employer, the latter is likely to pay what it always has paid.* Generally speaking, no one in government

has official responsibility for maintaining wage or other standard with reference to personal service, even though almost any governmental unit is investing more of the people's tax money in its pay-roll than in any other item of expense. The inevitable consequence of lack of policy has been injustice, the breeder of discontent. This in turn has led to lowered standards of efficiency, either because of indifference toward the work or of the large number of voluntary "quits."

Wide-awake employers have come to realize since 1914-1915 that the wage scale will not take care of itself. In its dealings with industry, the Federal Government itself did much to stimulate rational consideration of what a fair wage is. Its wage boards, coal commissions, minimum wage commission, and the like, called attention to the outstanding factors that go to determine such a wage. They made current, for instance, the doctrine that the worker has a right to a living wage, and they then helped develop the ways and means of determining what a living wage is. This led to the growing appreciation of the difference between real wages and nominal wages. In many quarters, the analysis of the work done served as the basis for establishing equal pay for equal work, and the relative value of different types of work was also given due emphasis.

There are a few cities in the country, three or four counties, and four or five states that have approached the question of a fair wage scale along the lines of the principles stated. In the main, however, the policy of drift is the accepted policy of the government-employer. As a result, incon-

* Compare the salary scale as well as the recent salary increases paid to the policemen and firemen with what is received by the clerical force in the same municipal government.

sistencies abound and underpayment is the order of the day.

The salary conditions of a mixed group of workers employed in forty to fifty county institutions of one of the Mid-Western States were recently analyzed with reference to present practice and also with reference to the factors that constitute a fair wage. As these conditions typify what may be found almost anywhere in the country, a brief summary is here brought together. It will be seen that in spite of all statements to the contrary, the worker is treated as a commodity; his price is determined not by the worth of his contribution as computed by any known method, and least of all with regard to what it costs him to live on, to keep well on and to retire on.

The county or children's home is a well-known establishment in a number of our states. It is usually situated outside the small city or town and is often surrounded by open grounds that may or may not be cultivated. Ordinarily, the children are sent to the schools of the neighboring community, although a few of the larger organizations have their own school plant. The staff of the typical institution consists of a superintendent, a matron or assistant superintendent, who is usually the wife of the superintendent, two governesses, one in charge of the boys, and one, of the girls, and a varying group of other helpers, such as a cook, kitchen and chamber maids, a farm hand and a janitor.

Salary data were collected for all the members of the staff in the forty homes. In order to make sound comparisons, other information was also brought together. This included the total annual pay-roll and all other expenditures, the average number of children cared for, and the acreage under cultivation. It may be sufficient for the purpose of our inquiry to compare the salaries paid superintendents, matrons and governesses with reference to their responsibilities and other factors that properly affect wages.

Many Inconsistencies

The maximum salary paid any superintendent, according to the reports, is \$2,400.* The superintendent receiving this salary is responsible for 200 children, he expends over \$64,000 a year and has a salary roll of

* Board, lodging and laundry form a part of the remuneration in all cases.

nearly \$14,000. In all these matters this institution stands near the very top of the list. Manifestly, this is as it should be. Not that the salary is sufficient, but it does bear a certain relation to the salaries and responsibilities of other superintendents. But the superintendent getting the minimum salary of \$425 a year is responsible for an expenditure of \$16,000, a total well up in the whole list, his pay-roll is \$2,169, about the middle of the list, and his institution has on the average 20 children. In this it is third from the lowest. Apart from the last factor, it is evident that these records do not warrant payment of the lowest salary in the scale. That a man responsible for the proper expenditure of \$16,000 should be paid at the rate of \$425 per year is, on the face of it, indefensible.

Turning to the group of superintendents receiving the most common salary—in view of the small number an average is likely to be misleading. This is made up of those receiving from \$840 to \$960 per year. Nine superintendents of the forty reporting are found in this group. The annual expenditures for which they are responsible range from \$9,000 to \$29,000 per year. In most of the nine cases, the total expenditures exceed the most common total spent by forty homes, which is between \$5,000 and \$14,000. The pay-rolls for the nine institutions run from \$1,440 to \$5,341, the number of children cared for from 21 (there are only three institutions having less) to 86 (there are only seven having more); finally, the acreage cultivated ranges from $\frac{1}{2}$ to 150 acres (there are two having larger acreage). The incongruities are evident—these nine superintendents receive about the same salary, but according to any other standard—number of children or subordinates, amount of annual budget or acreage—they cover nearly the whole scale from top to bottom.

For the matrons the same inconsistencies appear. Limiting our attention again to the most common group for which the average wage is between \$400 and \$499 per year, that is, \$33 to \$41 per month, we find that there are nine matrons paid at this rate. But the number of children cared for in the nine institutions ranges from 15 to 83. Fifteen is absolutely the smallest number in the forty homes, and 83 the eleventh from the top. The annual pay-rolls in the institutions which these matrons help to manage run

from \$377 to \$5,341 per year. Of these pay-rolls, five are below and the rest are either in or above the amount of the pay-rolls in the most common group. Again from the point of view of the relation of the matron's salary to the superintendent's salary for the nine institutions, the former ranges from 16 per cent to 87 per cent of the latter. Finally, to compare with the salary paid the cook, in five of the nine cases the matrons receive more than the cook; in two of the four cases where they receive less, one matron responsible for a home providing for 63 children receives \$10 per month less than the cook; and in an institution of 83 children the matron receives \$15 less than the cook.

A similar absence of a fair standard is found in the case of governesses, the mothers of the home. The most common wage paid to governesses is \$30 per month. This is \$1 per day, for the typical governess works thirty days a month. Like the mother of a family, she is subject to call at any hour of the night. For this service she usually receives less than is paid the cook in the kitchen and much less than is now necessary for maintaining the most modest standard of life. This is a striking instance of labor exploitation, for there is manifestly no proper relation between the service rendered and the compensation paid.

Underpayment Is Unprofitable

But entirely apart from the human justice or injustice involved in the salary conditions just outlined, there is the very serious question of the efficiency sacrificed because of the current policy. All experience goes to prove that labor exploitation does not pay in the long run. Generally speaking, the well-paid trades are the prosperous trades, just as the high-wage countries are the prosperous countries. Underpayment means underservice. It means a low-spirited organization, high labor losses through turnover, a restricted field for recruitment, and, taken all in all, makes for a continuous deterioration of working standards.

It would be an object lesson well worth while to compile a table showing for the past five years the number of separations and conditions for recruitment, for instance, among governesses in country homes. The average cost of replacement should be estimated by taking into account the amount of time and money spent by superintendents

in the course of a year in unearthing recruits, and the cost of training newcomers into the duties of the position. The amount of time the place was vacant or filled by an overworked matron or a temporary make-shift worker should also be computed as a part of the cost of replacement. All of the above might be estimated on a conservative basis, just as employment managers compute the cost of labor turnover in the factory. But of course it would not be possible to estimate the intangible losses sustained by the children because of repeated changes, particularly when the new recruit did not measure up to her predecessor in personality, character and force.

On the whole, it might safely be assumed in advance that any investigation of the turnover among governesses or similar workers would be concluded with a statement as to the deterioration of the service rendered. With the keen competition for labor on the one hand and, so far as purchasing power is concerned, the decline of the wage scale during the past five years on the other, there has undoubtedly been a steady deterioration of the force. This has been a matter of common observation among those who have come in contact with almost any group of government workers.

Analysis of the pay-rolls of the county homes warrants this conclusion, therefore, that, taken as a whole, they have no intelligent wage policy. The policy of no wage policy applies to the whole corps of workers. According to any standard, the amount of annual budgets, the number of children in a home, the annual pay-roll, the amount of acreage under cultivation, the cost of living, wages paid elsewhere, there seems to be neither rhyme nor reason in the wages paid to superintendent, janitor, or assistant cook. The results of this policy of drift may be measured in terms of impaired service and serious labor losses.

Wage Standardization

A fair analysis of the salary policy that is operating in most of our governmental jurisdictions would, beyond the shadow of a doubt, give support to the conclusion just reached. It would constitute an indictment of existing conditions and a challenge for constructive action. Practically every investigation of employment conditions that has been made public in the past decade goes to prove this. As is well known, a

number of states, cities and counties, as well as the Federal Government, have caused such investigations to be made. The remedy that has been worked out in many cases and adopted in an increasing number is wage standardization. The initial step in this procedure is classification, that is, the grouping together of similar positions on the basis of qualifications and duties. The outstanding features of a standard wage scale are then the following:

1. Of fundamental importance is a living wage for the lowest-paid position. In these days of fluctuating money values, further provisions should be made for revising the minimum wage whenever material changes in the purchasing power of money occur, as this is evidenced in official cost-of-living index figures. In this way the first rung of the ladder, the minimum wage, would always be above the surface of the water whatever the height of the tide. If the first rung is higher or lower, all the others would be correspondingly higher or lower.

2. The second principle is that of equal pay for equal work. Its corollary is that attention should be given to relative values so that differences in responsibility, skill, difficulty and hazard shall be reflected in the wage scale.

3. Under wage standardization there should then be considered the "going wage," that is, what is paid, first, for the same work elsewhere, and second, for similar types of work paid by similar public and private institutions. Certain cities and states, where there is a standardized wage scale, would supply valuable information on this score. For example, for the type of institution which we have been considering, it would also be important to learn what is paid teachers, cooks, housemaids and farm hands by first-class employers in the various communities similar to those in which the county institutions are situated. Comparative data of this sort are indispensable, because institutional workers are drawn from the same reservoirs of supply.

4. Finally, provision should be made for what might be called efficiency increases; that is, a range should be set for each one of the positions in the group, making possible recognition of seniority and increasing efficiency. The entering wage should normally be the lowest wage.

On the basis of the above information, a defensible wage scale could be set up that

would be bound to commend itself to the appropriating bodies and the public in general. In this way, the question of a fair wage could be considered on its merits and taken out of the realm of tradition on the one hand and personal opinion on the other.

Some one has remarked that retrenchment may take on two forms; saving and wise spending, and that the latter is more important than the former. The establishment of a fair wage is recommended in the name of wise spending.

A committee of the Engineering Council completed, a few months ago, a study of the conditions in typical plants of six basic industries. According to this report, bearing the title "Waste in Industry," these industries are reaching only about 50 per cent of practicable production. The committee considers that more than one-half of the waste is to be charged to the account of management, and in this account faulty labor control is one of the outstanding items. Among other things, reference is made to the lack of a well-considered wage policy, lack of attention to labor conditions, and to the causes of voluntary withdrawals. All of these charges are directly applicable to the business of government.

Perhaps inspired by this report, the chairman of the legislative committee on taxation of New York State recently pointed out that lack of attention to waste may easily precipitate a "financial crisis in government of more far-reaching effect than a financial crisis in industry." This is a timely warning and one that comes from an authoritative source. It has direct bearing on the topic under consideration. For if an investigation were carried on similar to the one just completed by the committee of the Engineering Council, it would undoubtedly prove that even a larger portion of waste was due to faulty employment control in government than in industry, because the costs for personal service in public administration absorb a larger per cent of the annual budget than in private enterprises. Such an investigation would certainly show that the most obvious fault in the employment policy of the typical county, city or state in this country is the absence of a well-balanced and up-to-date salary scale. It is, therefore, in the name of real retrenchment that attention is directed to the principles of an intelligent salary policy as a substitute for the traditional practice of drift.

Motors Protect and Effectively Serve Municipal Interests



A KINNEY ROAD-OILER MOUNTED ON A KELLY-SPRINGFIELD TRUCK OPERATED BY MARION COUNTY, OHIO, IN MAINTAINING ITS ROADS



THE MOTOR-CYCLE SQUAD OF LITTLE ROCK, ARK., MOUNTED ON HARLEY-DAVIDSON MACHINES

Photograph furnished through courtesy of B. C. Rotenberry, Chief, Police Department, Little Rock, Ark.

FEBRUARY, 1922



LAYING A CONCRETE SEWER PIPE FOR JACKSON, MICH., IN A TRENCH DUG BY A BAY CITY WALKING DREDGE OWNED BY PETER FRANDSEN, OF JACKSON

What Does It Cost to Run Your Motor Trucks?

If you cannot answer this question at once, secure a copy of the National Standard Truck Cost System from THE AMERICAN CITY, Tribune Building, New York City, put it into use, and know your operating costs.



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GRAND OPENING THE WHITE WAY

Program

- 7:00 P. M.** Serenading Detroit Realtors at Presbyterian Church
7:30 Opening of the Big Carnival of Fun by Pagoda Band and singing of America, Court House Square.
7:35 Songs, Leland Olmstead and Band, Solo, "The Bells of St. Mary's"
7:40 Address, Oscar C Lungerhausen
7:45 Turning on New Boulevard Lights, Mayor Sarns

Only a few months ago, Mt. Clemens, Mich., celebrated the opening of its new White Way, in which King standards were used. The feeling of civic pride, increased safety and improved trade from such an installation, may be possessed by any city. Our Engineering Department is available to help solve your lighting problems at any time.

King Manufacturing Co.

53 West Jackson Blvd.

Chicago, Illinois

How Some Cities are Controlling Their Motor Fleets

Interesting Data Compiled by the Bureau of Municipal Research, Toronto

IN an endeavor to bring about the use of motor vehicles of all types by the various city departments in Toronto, the Bureau of Municipal Research of that city made an examination of the methods employed by other cities. Toronto's fleet is composed of 38 motor-cycles, 67 passenger cars, 43 commercial trucks, 12 ambulances, etc., and 26 pieces of fire department apparatus.

New York City found that the old method of department control of motor trucks was extravagant of equipment and wasteful of time and money. A municipal garage was established in 1916, but the system of assigning cars was objectionable owing to the time wasted in waiting for cars, and on August 3, 1921, a new system was inaugurated with approximately 25 municipal taxicabs. The service is operated just like that of a private company. The taxicab stand is located just outside of the Municipal Building, and cars start from the head of the line. It is claimed that the result of this innovation is a more economical and efficient system.

Oakland, Calif., as an efficiency measure to provide easy transportation for municipal employees at a minimum cost to the taxpayer, established a municipal garage in 1913 under the supervision of the Commissioner of Streets. The operation of the garage has exceeded the expectations of the department, and, while it is not considered 100 per cent efficient, it is as nearly so as could be expected when consideration is given to the variety of makes of cars that are handled. All motor apparatus owned by this city, including fire apparatus and Board of Education equipment, is repaired by the municipal garage.

Detroit, Mich., has organized its motor service under the Superintendent of Transportation, who reports directly to the Mayor. The equipment of the Board of Education and the Fire Commission is not controlled by the Superintendent of Transportation. The amount of saving to the city has not been computed, but it is believed that the economy effected is substantial.

Winnipeg, Manitoba, Canada, strictly speaking, does not operate a municipal garage, but the hydro-electric system there built and operates a garage in which vehicles belonging to other city departments are cared for and repairs executed at cost plus a percentage to cover the up-keep of the building.

San Francisco, Calif., has over 100 city-owned cars, but no municipal garage, and is seriously considering the establishment of one to effect a saving in the maintenance of its machines.

Suggestions for Toronto of General Interest

Toronto has experimented with the municipal garage idea. The city recently rented floor space in a privately owned garage and under the Division of the Commissioner of Property cares for 31 passenger cars, 13 motor-cycles and 2 trucks. Records of cost, mileage traveled, etc., are not kept for each car, nor for the entire fleet. The suggestions made by the Bureau of Municipal Research for Toronto are pertinent and worthy of study by municipal officials throughout this country and in Canada.

It is recommended that the Toronto City Hall courtyard be used as a taxi stand for a number of the municipal passenger cars now assigned to departments but not in constant use. These, when wanted, might be dispatched from the central office in the City Hall, driven either by one of the staff of chauffeurs or by the city official requiring transportation, and return to the stand on completion of the run, ready for the next call. Such a plan might at least provide some departments with motor transportation of which they are now in need without reducing that of other departments. This taxi service should, of course, be restricted to important public business.

It is further suggested that the present departmental garages and machine shops could always be used as the framework on which eventually to build up on central management a more fully coordinated system. This does not mean that the operation

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of all motor equipment should be centrally controlled, nor that equipment need be brought to one central garage for repair or storage. The police department should probably attain full control of the operation of police vehicles. Minor repairs and adjustments to fire department equipment should usually be made at the fire station. All equipment, wherever held, should be subjected to inspection from fully qualified motor mechanics operating from a central division. The major repairs should be made by, or under the supervision of, this division.

Requests for replacement of, or additions to, department motor equipment should be referred to the central division, where a re-

port could be obtained as to whether equipment already owned by the city would be available. The head of the division should set standards of quality before purchase, and pass on quality after delivery and before acceptance by the city. It is not probable that with centralized management of city garages and motor equipment subject to the modifications above mentioned and with adequate records of cost, service, etc., a less sum than \$275,000 would be required for the city's motor fleet, and in all probability a more effective use of the city's motor equipment would result from centralized management and unified control of the entire fleet.

A Competitive Bid Must Conform Exactly to the Advertisement

AN award by a public body of a contract for the doing of work or the purchase of supplies, made after advertisement and competitive bidding, must be according to the terms advertised to prospective bidders, so that all may be on the same footing, holds the New Jersey Supreme Court in the case of *Pew v. Commissioners of Fire District No. 1, Chester Township*, 114 Atlantic Reporter, 151. Accordingly, it was decided that, where an advertisement for bids to furnish a fire truck with complete fire pumping apparatus required separate specification of prices as to

each part proposed to be furnished, an award could not be made on a lump sum bid.

The opinion adds, in passing, that it was to be doubted whether a restriction of bidders to "well-known manufacturers or distributors of fire apparatus" is a proper restriction in an invitation for bids. It is suggested that this "purports to shut out the concern of high standards whose equipment may be entirely satisfactory to the underwriters and whose responsibility may be unquestionable, but which has not yet been long enough in the business to account as a 'well-known' concern."

On the Calendar of Conventions

FEBRUARY 17.—TRENTON, N. J.
New Jersey Sewage Works Association. Annual meeting. Secretary-Treasurer, Myron E. Fuller, 170 Broadway, New York, N. Y.

MARCH 1.—CHICAGO, ILL.
National Community Center Association. Annual meeting. Secretary, Le Roy E. Bowman, 503 Kent Hall, Columbia University, New York, N. Y.

MARCH 1-2.—WASHINGTON, D. C.
National Rivers and Harbors Congress. Annual convention. Secretary, S. A. Thompson, 824 Colorado Building, Washington, D. C.

MARCH 14-16.—LONDON, ENGLAND.
International Garden Cities and Town Planning Association. International conference. Honorary Secretary, C. B. Purdom, 3 Grays Inn Place, London, W. C., England.

APRIL 10.—NEW YORK, N. Y.
National Committee on Prisons and Prison Labor. Annual meeting. Secretary, J. K. Jaffray, Broadway and 116th Street, New York, N. Y.

APRIL 19-21.—SPARTANBURG, S. C.
Tri-State Water and Light Association of the Caro-

linas and Georgia. Annual meeting. Secretary, W. F. Stieglitz, Columbia, S. C.

MAY 9-11.—ATLANTIC CITY, N. J.
National Fire Protection Association. Annual meeting. Secretary, Franklin H. Wentworth, 87 Milk Street, Boston, Mass.

MAY 15-19.—PHILADELPHIA, PA.
American Water Works Association. Annual convention. Secretary, J. M. Diven, 153 West 71st Street, New York, N. Y.

MAY 15-21.—WASHINGTON, D. C.
Chamber of Commerce of the United States of America. Annual meeting. Secretary, D. A. Skinner, Mills Building, Washington, D. C.

AUGUST 9-18.—SAN FRANCISCO, CAL.
International Association of Fire Engineers. Annual meeting. Secretary, James J. Mulcahey, City Hall, Yonkers, N. Y.

OCTOBER 9-13.—CLEVELAND, OHIO.
American Society for Municipal Improvements. Annual convention. Secretary, Charles Carroll Brown, P. O. Box 234, St. Petersburg, Fla.



Making School House Steps Safe

Architectural attractiveness was a factor—it was essential that every step be made slip-proof and safe—the steps had to be made durable—maintenance costs had to be eliminated—

The architects (Frost & Chamberlain) of the Worcester Girls' Trade School, Worcester, Mass., a beautiful \$350,000 building, solved this stairway problem with ALUNDUM SAFETY TILE. The stairtreads are cast iron with steel risers. The cast iron tread is depressed to receive the tile which is set in cement mortar.

Thus every step in the building, two sets of stairways from shower baths to the top floor, are made slip-proof, trip-proof and wear-proof and the architects were able to get the desired harmonious effects.

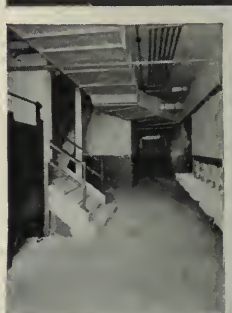
ALUNDUM SAFETY TILE is manufactured by

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T31



Chamber of Commerce Activities in Public Affairs

Where Fires Are Embarrassing

INDIANAPOLIS, IND.—The fire prevention program of Indianapolis resulted in reducing fire losses for the first ten months of 1921 from \$1,500,000 to \$900,000. This program was carried out under the auspices of the Fire Prevention Committee of the Chamber of Commerce, with the hearty cooperation of the Indianapolis Fire Department.

The first official move was the organization of the Chamber of Commerce Fire Prevention Committee. A city-wide survey with photographs was made, and the records were analyzed to show the causes of fires. The Committee sponsored a "fire prevention organization," which has grown until it now numbers more than a thousand persons in all parts of the city. Realizing that it is impossible to keep everybody continuously at white heat on a subject, the Committee made the campaign a series of efforts, coming back to the old idea time after time, and driving it home with new force.

The first move was made in June, when every home in the city was inspected by a fire department official. With the cooperation of the Sanitary Commission, the entire city was combed and cleaned up. Notices were given to a large number of property owners, and it was necessary to conduct about 20 prosecutions, but it resulted in the elimination of practically every fire hazard in Indianapolis.

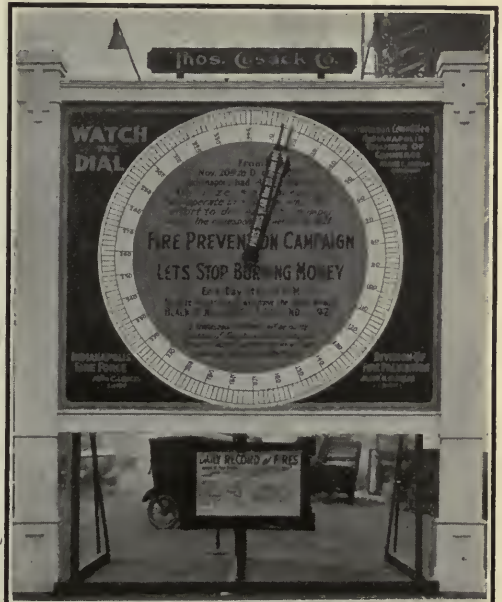
The next campaign was in the fall, culminating in the observance of the national Fire Prevention Day. Large posters were placed conspicuously all over the city. Thousands of pledge cards were distributed, with the result that there are now in the Committee's office 40,000 signed cards from children and adults pledging the signers to cooperate in every way to make Indianapolis a cleaner, safer, healthier city. In the work of arousing interest, essays were written in all the public schools, and daily stories were

carried in the newspapers for more than six weeks.

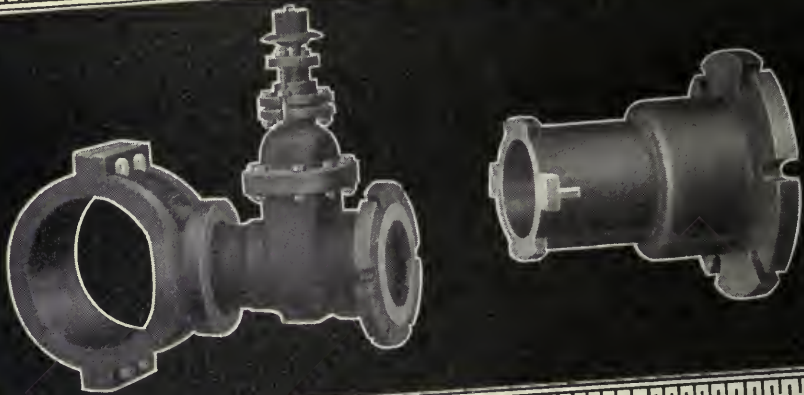
On Fire Prevention Day the Fire Department conducted a parade of its apparatus. During the ten days previous, more than 700 speeches were delivered before civic meetings of one kind or another.

The campaign that is now on, centers around the 12-foot dial shown in the picture. "Watch the Dial" is the advice on the board, which records the fire loss in comparison with the previous year. Each day at 12:30 the hands are moved. Beneath the clock is kept a daily record of fires, with the cause of each. It is estimated that of the fires recorded, 27 were from unavoidable causes, such as lightning, and the remainder, nearly 3,000, were due to negligence or carelessness.

Fire prevention in Indianapolis has just started. The committee does not expect to



A PIECE OF EFFECTIVE, CONTINUOUS PUBLICITY FOR FIRE PREVENTION IN INDIANAPOLIS, IND.



MUELLER "C" DRILLING MACHINE

For Making Lateral or Branch Connections

This machine is the perfected product of exhaustive experiment and practical experience over a period of years.

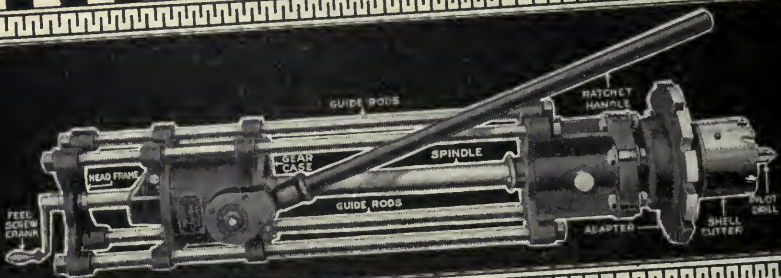
Skeleton in form, with bevel gear drive and automatic feed, it can be operated by one or two men. For ease of operation and speed in cutting it has no peer. In its construction throughout—in materials and workmanship—the "C" Drilling Machine represents the highest MUELLER standard. Makes connections from 2' to 8' inclusive, in pipe from 4" to 48" in size.

For making large connections to mains, Sleeves and Valves can be supplied in all sizes from 4 x 2 to 48 x 48—or, when desired, Dry Pipe Connections.

Detailed descriptions and prices on request.

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 San Francisco, 635 Mission St., Phone Sutter 3577
 New York City, 145 W. 30th St., Phone Watkins 5397
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Mueller Metals Co., Port Huron, Mich., Makers of "Red Tip" Brass Rod; Brass and Copper Tubing; Forgings and Castings in Brass, Bronze and Aluminum; Die Castings in White Metal and Aluminum; also Screw Machined Products.



When writing to Advertisers please mention THE AMERICAN CITY.

get its maximum results for two or three years; and it hopes to bring public sentiment to such a plane that the person who has a fire will be ashamed of it, rather than feeling himself the victim of an accident. The people of Indianapolis have come to believe that fires are preventable. The committee has their complete cooperation. That is the biggest tangible result of the movement.

FRANK A. JORDAN,
Chairman, Fire Prevention Committee, Indianapolis Chamber of Commerce.

A Woodland Swimming Pool

FROSTBURG, MD.—The accompanying picture shows a section of the new community pool just completed by the Commercial Club of Frostburg, Md. More than 4,000 people attended the opening of the pool on August 24, at which speeches were made by President Gillette of the Commercial Club and Mayor O. R. Rice. The pool is used for swimming in summer and skating in winter.

Contractors estimated it would cost \$10,000 to build this pool; it was, however, constructed by the Commercial Club at an actual expenditure of \$2,300. Most of the labor was voluntary on the part of the citizens of the town; as many as 200 men and

boys on several occasions worked all day without pay, and the ladies of the town served ample dinners on these occasions.

The pool is about 140 feet square, has concrete side-walls and bottom, and slopes down to a depth of 8 feet. The shallow corner of the pool is fenced off for the children, who are also provided with a large sand-pile. A small creek fed by springs furnishes water for the pool. The bed of this creek was excavated and a dam built; in this way running water constantly renews the pool, keeping it sanitary and fresh.

The setting for the pool is particularly beautiful, in a large grove at the foot of a tall mountain. Large, beautiful trees border three sides, and next spring a regular playground will be established near the pool.

The land on which the park and pool are located is leased by the Commercial Club. While the pool is entirely free, the Club issues admission cards to all who wish to enjoy its privileges. These cards may be taken up if the holders insist on breaking the rules and regulations governing the use of the property.

T. C. CARRINGTON,
Secretary, Frostburg Commercial Club.



CONSTRUCTED AT SMALL COST BY THE FROSTBURG, MD., COMMERCIAL CLUB, THE POOL PROVIDES A SKATING-RINK IN WINTER AND A SWIMMING POOL IN SUMMER

THE AMERICAN CITY

MORE THAN FIVE HUNDRED CITIES

Now Using
OSBORN
Push Brooms

NUMBER 500 is on the job in literally hundreds of cities: Big cities, little cities, cities where in winter the streets are full of snow, and others where snow is unknown, doing a good, honest job of it in helping keep the streets clean.

It is a splendid municipal push broom—just one of the line—but judging by the sales records and the testimony of its friends, it is by far the best broom on the market for street cleaning.

Tell us what your street sweeping problem is and we will be glad to make recommendation

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BRUSHES

BROOMS

LARGEST MANUFACTURERS of INDUSTRIAL BRUSHES AND BROOMS

A Novel Way of Financing a Chamber of Commerce Building

SACRAMENTO, CALIF.—Would one person out of every 100 in your city pay half of his dues in your Chamber of Commerce for ten years in advance? If so, your city can have its own Chamber of Commerce building.

Sacramento, capital of California, has such a building financed by such a plan. It is the realization of a hope harbored in the minds of Sacramento citizens for twenty years. Each year of the twenty witnessed a spasmodic attempt to make the dream of a Chamber of Commerce building an actuality. Then came 1921, and in twelve months the building was completed and occupied—a year, to the day, from the time the movement was launched!

The Sacramento Chamber had, for many years, occupied a rented room on a side street, scarcely the size of an ordinary store. To-day, in its three-story home, in the heart of the business district, the Chamber has: a spacious office room amply housing the organization's nine departments; an auditorium with a seating capacity of 500; a board of directors' room with accommodations for fifty persons; three office rooms on the mezzanine floor; a committee room with a capacity of 100 persons; a mailing room; two stock-rooms; a fully equipped kitchen with dumb-waiter making service easy to committee rooms in various parts of the building; a photographic department; a printing department; a storage room, checking rooms, lockers, closets, etc.

The auditorium is used also for dinners and dances, and the main office, by the simple process of removing the bronze posts and plush-covered ropes which separate the departments, can be quickly converted into a reception room.

There is not a more attractive office building in Sacramento, exterior and interior, than the new Chamber of Commerce building. But it is more than a fine building; it is the embodiment of the highest type of community spirit.

The site upon which the building was erected was acquired by the Sacramento Chamber a number of years ago. The building and equipment cost \$80,000, this being met by the prepayment of dues. So the site and structure stand to-day entirely free of debt and rated at \$130,000 in the Chamber's assets. The fine spirit which



EXTERIOR VIEW OF THE SACRAMENTO CHAMBER OF COMMERCE BUILDING

financed the building did not stop with the prepayment of dues. Some of the contractors made a reduction in their charges, much of the equipment was provided at a figure below the usual cost, and there were a number of items contributed.

In its new home the Sacramento Chamber is able to extend its scope of activity. Its service is not limited to Sacramento, but reaches out through the agricultural sections of the Sacramento Valley. Twenty chambers of commerce in Northern California use the building as their central meeting place. Parent-teacher associations of Northern California counties held their convention in it. Fruit growers and farmers gather here. Its facilities make possible the successful organization and operation of state societies, bringing the people of Sacramento and vicinity into closer touch. Through a unique checking service, country shoppers are relieved of the disagreeable features which attend the delivery of articles. The Rotary Club of Sacramento holds its regular luncheon-meetings in the commodious auditorium. The membership of the Chamber is brought into closer relationship by entertainments, dances and social events "in their own big home." These are but a few of the score of features wherein the Chamber's service is more extensive and its activities more effective through the erection of the new building.

The wider service thus made possible answers the question: "What will the Chamber of Commerce do to overcome the loss in annual revenue brought about by the pre-



Spreading the Gospel
of Mudless, Dustless,
All-year Roads—

WHEREVER you have seen one of these trucks at work you may be sure that GOOD ROADS have come to that community. For the Tarvia Truck Sprayer is the herald of smooth, dustless, mudless "all-year" roads that are less expensive to build and maintain than any other type of modern highway.

How about the roads in *your* community?

If you have *any* road problems—either construction, maintenance or repairs—put them up *today* to the engineers of our Special Service Department. Their advice, based on wide experience with every type of highway construction, is free for the asking—and it involves no obligation whatever on your part. Please address your letter to our nearest branch.

New York	Chicago	Philadelphia	Boston	St. Louis	Cleveland	Cincinnati	Pittsburgh		
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INTERIOR OF THE BUILDING OF THE SACRAMENTO CHAMBER OF COMMERCE. THIS IS A MODEL FOR CHAMBERS THROUGHOUT THE UNITED STATES

payment of dues for the financing of the building?" At first glance, that might appear to be a serious detriment. The fact that a large number of members have paid half their dues in advance—in the case of Sacramento the annual dues are \$25—should of course be taken into consideration. It means that the Chamber gets only \$12.50 in cash from each member who subscribed to the building, for annual operating expenses. But in the case of Sacramento, there still remained approximately 1,000 members who paid the full \$25, while the Chamber has an additional \$45,000 income from its "Service Fund," subscribed by the banks and business institutions. Moreover, the wider service meant wider interest in the Chamber's work and consequently a sufficient number of new members to meet the apparent reduction in income. This, coupled with the increased interest in the Chamber's work, and the feeling of pride which the erection of the building has created, makes the Chamber a substantial and active institution, with its successful future operation definitely assured.

Sacramento citizens point with pride to the fact that their city is the first on record to secure a chamber of commerce building by the unique method of financing worked out by A. S. Dudley, Secretary-Manager of the Chamber. Erection of the structure has impressed upon them a higher and broader meaning of the words "Chamber of Commerce." Each member of the Chamber feels he is a stockholder in one of the big-

gest projects in his city. And he has a world of satisfaction, too, in knowing that he has been a factor in providing for all groups of citizens working for the direct welfare of Sacramento, every facility for efficient community service.

IRVIN ENGLER,
Assistant Secretary, Sacramento Chamber of
Commerce.

Chamber of Commerce Encourages Municipal Music

MEMPHIS, TENN.—In January, 1921, the Park Commission of Memphis inaugurated a Division of Municipal Music and Dramatic Art, under the joint support and supervision of the Park Commission and the Chamber of Commerce. In this department this city can boast of a civic venture of an artistic type probably never before attempted in this section.

Arthur Nevin, appointed Director, began to form a chorus and orchestra. The chorus began with approximately thirty-seven members and has increased its enrollment to two hundred or more. The orchestra numbered about seven at the first rehearsal and finished the season (three and one-half months) with an enrollment of over forty of both professional and non-professional musicians. The orchestra, combining with the Municipal Choral Society, gave five public concerts at the leading theater in Memphis. These performances have gradually gained the interest of the people to such an extent that next season the orches-

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These culverts, known from one end of the country to the other, are made of genuine open-hearth iron (99.875 percent PURE IRON COPPER ALLOY). We have sold thousands of feet of them with no other exterior protection than a coat of asphalt rubber paint. Were it not for the copper content of this extremely pure iron, we would not dare sell these culverts without a heavy coating of spelter or galvanizing, as in the case of those companies who sell pipe made of just pure iron. Newport Culverts are the most rust-resisting and strongest culverts on the market today.

Newport genuine open-hearth iron culverts are guaranteed to last longer under identical conditions than any other corrugated metal culvert pipe. It is made in full-round and half-round types in order that city, county, or state official may have a culvert adaptable to every condition.

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NEWPORT CULVERT CO.
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NEWPORT CULVERTS



tra will have fifty members, and the Choral Society has doubled its number to nearly four hundred voices. Steps have now been taken for the building of an open-air theater in one of the largest parks, modeled after the municipal theater in Forest Park, St. Louis, in which grand opera and other musical attractions on a large scale can be given.

By carefully preparing his program, giving at the start only such music as the general public can understand, Mr. Nevin is bringing the people to an appreciation of the best music. To know the character of music that is given to the people, one has but to glance at the list of composers on the programs—Beethoven, Verdi, Grieg, Bizet, Wagner, and many others. The idea of this work is very unusual. It recalls the spirit of the Old World, in having national opera houses supported by public funds.

The Music Committee of the Chamber of Commerce has for years endeavored to promote a higher appreciation of music and also better opportunities for all the people to gain the cultural advantages that good music gives to a people. The cooperative arrangements with the city through the Memphis Park Commission is the latest step in this direction. The Director's salary and the expenses incident to this past season's work, in addition to income from the con-

certs, have been jointly borne by the Chamber of Commerce and the city. It is probable that the entire expense of the Division of Municipal Music and Dramatic Art will be assumed by the city next season and that the Chamber will be left free to devote its efforts to further experimental extension work in cooperation with the city.

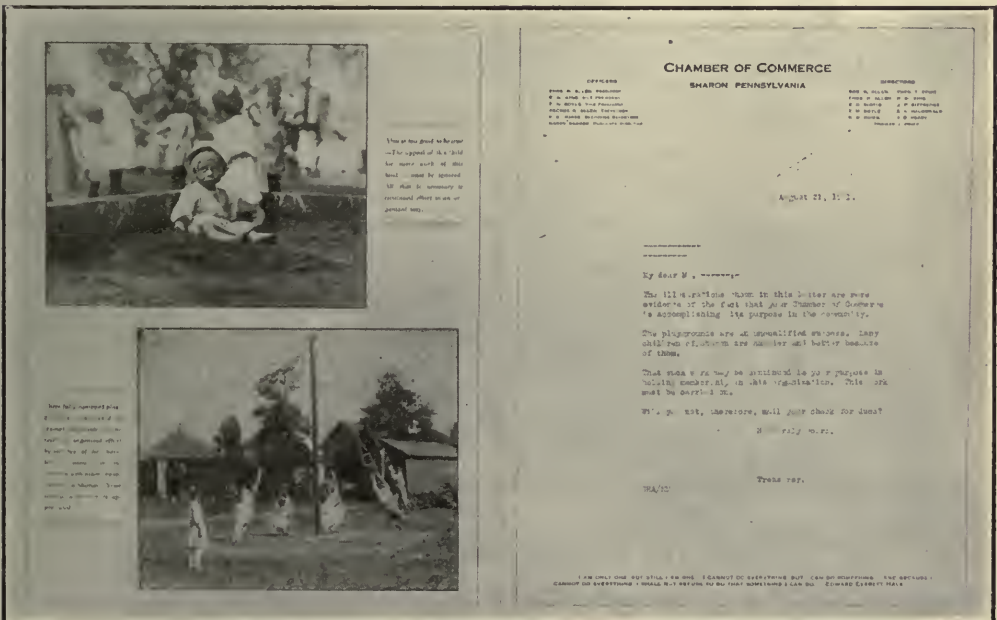
WM. C. HEADRICK,
Assistant Manager, Memphis Chamber of Commerce.

An Effective Collection Letter

SHARON, PA.—The accompanying illustration shows the front and back pages of a four-page collection letter successfully employed by the Sharon Chamber of Commerce. The first page is the usual Chamber letterhead, with its request for the prompt payment of dues. The other three pages are devoted to an attractive series of pictures, accompanied by brief, telling sentences describing some of the objects for which the Chamber needs money. In this letter special emphasis was laid on the desires of the Chamber to provide better playground facilities for the city's children.

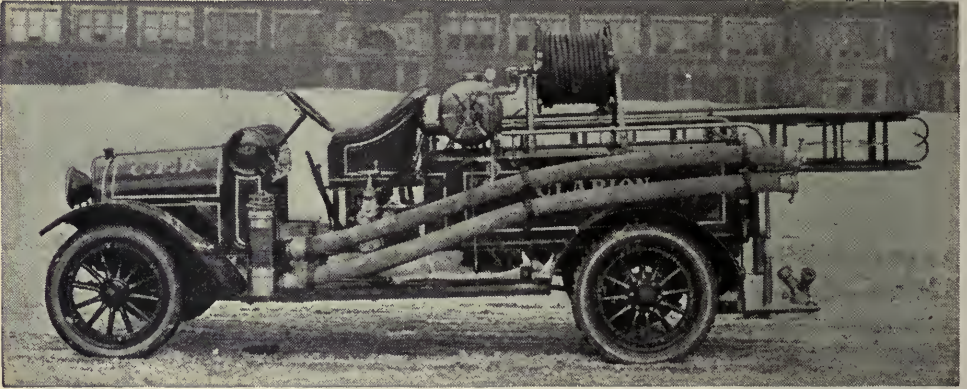
The letter is distinctly out of the ordinary in its graphic method of appeal, and its circulation has met with a very favorable response.

P. A. JONES,
Executive Secretary, Chamber of Commerce.



THE "DUNNING LETTER" OF THE SHARON, PA., CHAMBER OF COMMERCE WOULD BE HARD TO RESIST

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Reo Speed-wagon, Triple Combination, In Service Clarion, Pa.

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WHEN buying fire apparatus you want to know what it will do largely by what it has done during its years in the field. You want to know what other cities have found out about Northern Fire Apparatus.

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Minneapolis, Minn.

The Preparation of a Layout Plan

MUCH has been written on the subject of the general principles which should govern the planning of a housing scheme, but the application of these principles to a specific site is not always the simple process that it might superficially appear to be. A short description of the progressive stages of the design for the lay-

in addition to the two tramway routes already referred to, there were four railway stations situated at convenient points outside the estate; and the traffic problem therefore resolved itself into the provision of suitable connections between the two main roads and convenient means of access within the scheme itself.



THE LARGE AREA REPRESENTS A CITY, AND THE SMALLER, A 500-ACRE TRACT SELECTED FOR SUBURBAN DEVELOPMENT

out of an actual site may be, therefore, not without interest.

The site in question is situated on the outskirts of a large city. It comprises an area of about 500 acres of very undulating land, bounded on the north and south by main roads which are also tramway routes, on the east by a railway, and on the west by a road of some importance as a connecting link between the two main roads.

Upon examination of the area in its relation to the city, it became evident that the function of a housing scheme in this position was likely to be that of a suburb rather than that of a self-contained town, and the problem was approached, accordingly, from this point of view. Now, assuming the suitability of the site in other respects, the most important requirement of a suburb is the adequacy of its transport facilities. In this case there was ample provision, for,

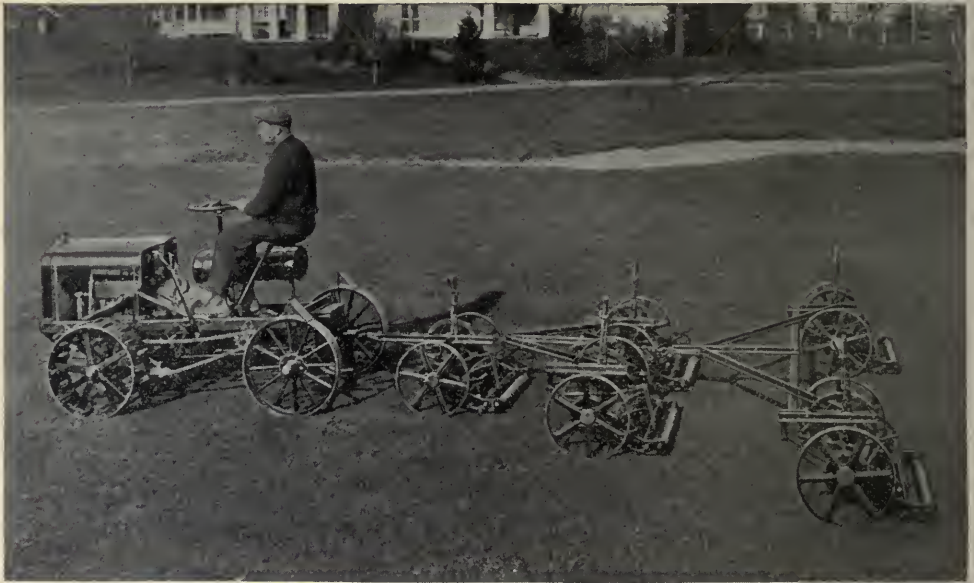
quarries, and the sporadic development which has already taken place. The slope of the land is such that advantage has to be taken, in locating the roads, of every assistance that nature affords, and the final scheme provides roads giving access across and from corner to corner of the site.

In describing the preparation of a layout it is impossible to avoid the treatment of each factor separately, and though the loca-



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WORTHINGTON MOWER COMPANY



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With Convertible Quint attachment cuts a swath of eleven feet, four inches.

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The public is advised that the combination of gang lawn mowers with motor tractor, either of the draft or push type, is fully and broadly covered by U. S. Patents issued and pending, owned or controlled by this Company; that the sale of any tractor used in combination with a gang mower may render the vendor or user liable for infringement. This Company will protect its rights.

WORTHINGTON MOWER COMPANY

Shawnee-on-Delaware, Pa.

tion of the main roads has been dealt with without reference to the placing of the public buildings, open spaces and other important components of the scheme, it will be realized that all these matters are intimately related and must be considered concurrently. Thus the principal feature, which takes the form of a wide boulevard stopped at one end by a market and shopping center and at the other by a group of public buildings, was determined by a consideration of its central position and relation to the intersection of the main roads, the dominating nature of the site chosen for the public buildings, and the value of the stream as a decorative adjunct. In a similar way subsidiary social centers were placed at points where convenience of access and a natural prominence or special suitability of character at once suggested the appropriateness of the position. See the second illustration.

Parks and playing fields also received careful consideration on the same lines, and the site for each was chosen with particular regard to its natural suitability and proper place in the general scheme. The two disused quarries, for instance, were admirably fitted for development as public gardens; the stream in the valley called for a narrow belt of park land running right through the

estate; and the few comparatively level sites were used for playing fields.

The framework of the scheme being settled, the planning of the subsidiary roads now claimed attention. Here the problem was one of providing the most convenient, economical and attractive sites for houses, and a close study of the contours was essential. On steeply sloping ground of this kind the roads naturally followed the contours to a large extent, and an irregular development resulted, which is in harmony with the character of the site and contrasts agreeably with the more formal treatment of the centers. Provision was made for houses of all types, for in a scheme of this size it was obvious that many larger houses would be required, and sites for these were reserved in suitable parts of the estate.

In this way the layout was gradually built up, and though it is impossible in such a brief description to do more than touch upon the progressive stages through which it passed, some indication has, perhaps, been given of the particular application of the general principles which govern the preparation of all housing schemes.

F. L. T.

ACKNOWLEDGMENT.—Prepared from the Site Planning Number of *Housing*, published in London, Eng.

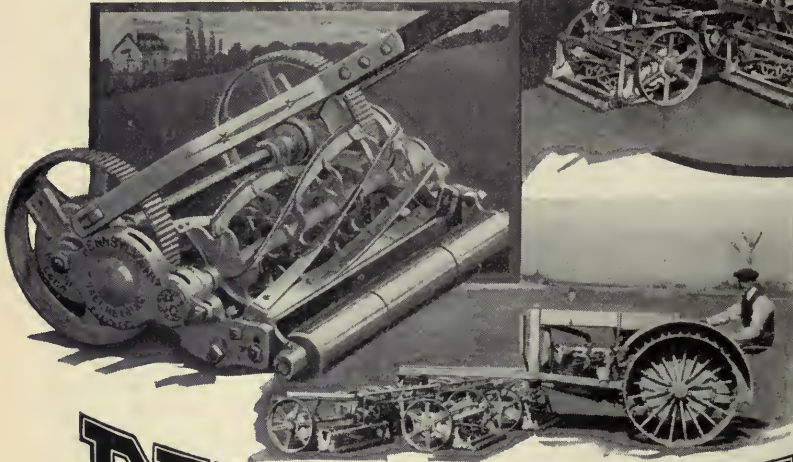
If Some One Thinks of It in Time, Your City May Have a Street Like This



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Pennsylvania TRIO; a time and labor saver for golf course, parks, large estates 86 in. swath.

Pennsylvania GOLF; closest cutting for putting greens, tennis courts and fine lawns.



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PENNSYLVANIA QUALITY LAWN MOWERS

WHETHER used in gangs or singly, each mower represents the utmost in mechanical perfection. Exclusive features such as self-sharpening, interchangeable parts, automobile type ball bearings, assure ease and accuracy in operation.

Their long record of service is due to the use of finest materials in making. For instance, all blades, not just one, as in ordinary mowers, are made of crucible, tool steel; doubly tempered.

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1615 North 23rd Street, Philadelphia

Arson and Some of Its Causes

With a Discussion of What Constitutes Evidence in Prosecutions for Arson

By J. A. Tracy

State Fire Marshal, Des Moines, Ia.

THE crime of arson is about as common nowadays as convictions for arson are uncommon. It is a difficult crime to prove. The more complete the burning, the less evidence can be secured.

There are three kinds of crimes called arson: 1, setting fire to another's property for revenge; 2, setting fire to cover up crime; 3, burning or causing to be burned a person's own property to collect insurance in excess of the value of the property.

While the insurance companies are liable only for the replacement value, or the value of the property destroyed, they are at the mercy of the assured when a total loss occurs, by reason of padded claims, especially if the case goes to court. The percentage of arson cases for revenge only or to cover up crime is very small compared to that of fires set for gain by the assured.

It is so easy to get insurance in almost any amount on almost any kind of property, that many persons plan for the destruction of property, await the proper time to set the fire, and cover up their whereabouts with a perfect alibi. It is a well-known fact that fires can be set to burn at a certain time—usually in the night, often destroying the plant and leaving no evidence to prove that the fire was set by design. Then we must prove beyond a reasonable doubt who set the fire or had it set.

If the case is one of conspiracy between two persons, the confession of one conspirator is not sufficient to convict the other conspirator unless it can be proved by corroborative evidence that a conspiracy did exist and that the fire was set with the intent to burn. A motive might also be proved on account of over-insurance and bad financial condition, but that is not sufficient, because the practice of writing over-insurance is common and has brought about one of the most alarming situations confronting us during this time of depression.

Under the Fire Marshal Law of Iowa every fire chief is, in fact, an Assistant State Fire Marshal, as he is required by law to

make investigations and report all facts to the State Fire Marshal.

Securing Evidence

Every effort should be made to find out where the fire started and its cause, if possible, to preserve all evidence and call the attention of helpers to suspicious circumstances and visible evidence, that they may make competent witnesses in case of trial. The evidence may be of value to the state in case of prosecution, or of value to the property owner to relieve him of suspicion, the purpose of the law being to get all the facts possible in order to protect the rights of all.

In case evidence is found to warrant the assumption that the fire was set by design, a guard should be put over the property so that nothing can be disturbed until a thorough investigation can be made by the sheriff, the police department, the county attorney or the state department.

In case oil cans or jugs or explosives are found, they should be removed and locked up. The owner or occupant should be interviewed as soon as possible as to the time he left the place and as to who advised him of the fire, and how he was advised. All evidence should be noted in a memorandum book and not left to memory. If this is done, it will be helpful to the department and have a tendency to decrease arson.

The best way to fight fire is to fight it before it occurs. This can be done in many cases by careful inspection, and should a fire hazard be found, orders to remedy it at once should be issued. If the order is not obeyed, the facts must be reported to the State Fire Marshal, giving the name and address of the owner, name of occupant, kind of occupancy, and general description of defects found. This information is necessary in order to get legal service on the owner and occupant.

In case over-insurance on any property is found, the insurance agents or the insurance companies should be informed.

ACKNOWLEDGMENT.—From a paper read before the Iowa State Firemen's Association, November, 1921.

How Large Parks Can Save Money

Many city parks throughout the country have greatly reduced the expense of keeping their lawns in condition by the use of Ideal Power Lawn Mowers.

These power mowing machines are truly great labor savers. This statement is borne out by the fact that many park superintendents are now using several Ideal Mowers as a result of the big saving that their first Ideal enabled them to make.

In fact, it is the *repeat orders* that say more for

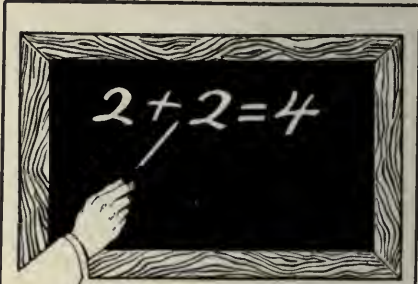
IDEAL Power Lawn Mowers

than anything we might write.

Moreover, the more grass you have to cut the more you can save. For extra large parks where there are big areas of grass to be cut the Ideal Triplex Power Mower has no equal. It will mow from 30 to 35 acres a day, is easily operated and absolutely dependable.

Then we make our standard 30-inch Ideal Power Mower and the Ideal "Junior" Power Mower, both of these machines are great labor savers in park work and there are thousands of them in use.

Write and get all the facts about the complete line of Ideal Power Mowing equipment. We will gladly advise you in selecting the most suitable equipment for your needs.



Just A Simple Problem in Arithmetic

The saving that can be made with Ideal Power Lawn Mowers is just about as simple as 2 times 2.

One man with a hand mower can average about $\frac{1}{4}$ of an acre per day.

One man with a 30" Ideal Mower will mow at least 5 acres per day.

To figure out the actual saving we will place a moderate estimate upon the wages saved. We will allow liberal pay for the machine operator and more than enough for mechanical up-keep, oil and gas, interest on investment, etc.

Wages of 6 men at \$3.00 per day working with hand mowers... \$18.00

Wages of one man at \$5.00 per day working with Ideal Mower... 5.00

\$13.00

For mechanical up-keep, oil and gas, interest on investment, ment, etc. 1.00

Net daily saving..... \$12.00

Estimated cost of Ideal Power Lawn Mowers..... \$350.00

12(350)29

24

110

108

2/12

The answer is simple indeed—less than 30 days saving pays the entire cost of the mower.

We will leave it to you whether a machine that will actually pay its own cost in a month's time is well worth investigating.

IDEAL POWER LAWN MOWER CO.

R. E. Olds, Chairman

400 Kalamazoo St., Lansing, Mich.

World's Largest Builders of Power Lawn Mowers

CHICAGO, ILL. 11 E. Harrison St.

NEW YORK, N. Y. 270 West St.

BOSTON, MASS. 52 N. Market St.

PHILADELPHIA, PA. 709 Arch St.

LOS ANGELES, CAL. 222 N. Los Angeles St.

NEW ORLEANS, LA. 130 Camp St.

PITTSBURGH, PA. 108 West Parkway

CLEVELAND, OHIO

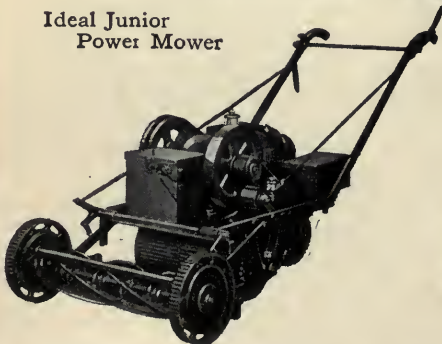
1500 Lakeside Ave.

DENVER, COLO. 28th and Wasee Sts.

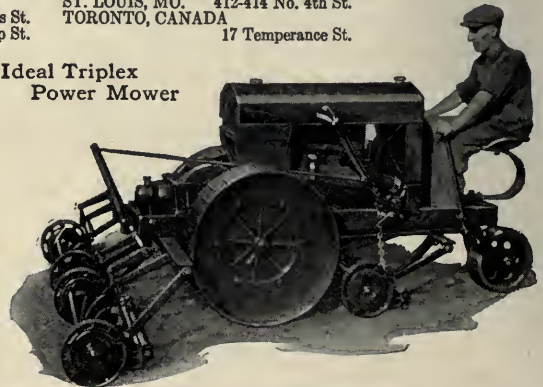
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TORONTO, CANADA 17 Temperance St.

Ideal Junior Power Mower



Ideal Triplex Power Mower



System in Naming and Marking Streets

By A. M. Husted

Tulsa, Okla.

AN interesting system of naming the streets was started by the town officials of Tulsa, Okla., some ten or fifteen years ago, and the method of marking them was established by the present street commissioner. A stranger finds no difficulty in locating any address in the city by means of this system of naming and marking.

The plan of naming the streets is commendable in its simplicity. The streets running north and south are named after American cities, except Main Street, which forms the base line for the eastern and western sections of the city. The streets east of Main and parallel to it are named after eastern cities and in alphabetical order, as Boston, Cincinnati, Detroit, etc., while those west of Main are named after western cities and also in alphabetical order, as Boulder, Cheyenne, Denver, etc.

Traversing Main Street at right angles are the Sante Fé and Frisco railroad tracks. These mark the division between the northern and southern sections of the town and form the base line for the numbering of the old streets, as First Street, Second, Third, etc. East of Main Street, First Street is called East First Street, while west of Main it is West First Street. In like manner, the streets named after cities are termed North

Boston or North Cincinnati when north of the tracks, and South Boston or South Cincinnati when south of the tracks.

Such a comprehensive system of naming streets would be of little value to a stranger unless the streets were properly marked. Through necessity, a cheap and efficient system of marking the streets was discovered by the street department. All street names are stenciled in black on a white background painted on the curbs, as shown in the accompanying illustration. They are painted only on the right-hand opposite corner, so that one driving down a street will be able to read the name of a cross-street while approaching it. It is estimated that these signs cost considerably less than the standard type of street markers in Tulsa.



STREET NAME PAINTED ON CURB

Two Changes in City Managers

On January 1, J. Walter Ackerman became City Manager of Watertown, N. Y., succeeding C. A. Bingham, who has taken the managership of Lima, Ohio. Mr. Ackerman is a civil engineer, and was for six years city engineer of Auburn, N. Y., during which period he built one of the first municipal conduit systems. After an interval during which he was resident engineer of the Ithaca Short Line, he returned to the

municipal field as Chief Engineer and Superintendent of the Auburn, N. Y., waterworks. Under his management the system has been extended and a filtration plant installed. Mr. Bingham was welcomed to his new position in Lima, Ohio, by a large banquet given by the Chamber of Commerce. The Lions and Kiwanis Clubs offered specialties, and an excellent spirit of cooperation was evident.

Finances of Sioux City, Iowa

Revised figures received from the Census Bureau show that the sums given for the receipts and expenditures of Sioux City, Iowa, on page 511 of THE AMERICAN CITY for De-

ember, 1921, should read as follows:

Per capita costs for year ending March 31, 1921, were \$44.70; per capita receipts, \$37.68, leaving an apparent deficit of \$7.02.



Paid Their Way Since 1914 in Tampa, Florida

Tampa's Police Department tried out several makes of motorcycles before it was decided to use Harley-Davidsons exclusively. Now, seven Harley-Davidsons (including three 1922 models) are on duty in this progressive southern city.

For emergency calls and messenger service, patrolling work, regulating traffic, enforcing parking rules, chasing automobile speeders, running down "motorized crooks"—on any kind of roads and in any weather—you can't beat a Harley-Davidson. Many cities have actually paid for one or more machines in a few weeks from the increased revenue a motorcycle has brought in.

A Harley-Davidson's ruggedness and durability assure years of dependable service, with surprisingly small upkeep cost. Far cheaper to run than the most economical automobile—in fact, the maintenance and operation expense of a Harley-Davidson is even less than the cost of keeping a horse.

See the 1922 models at your local dealer's. Get the new Harley-Davidson prices (25% reduction) and ask for free demonstration.

City officials and those interested in police department efficiency should have our new book, "Motorcycles for Police and Sundry Purposes." Write on your letterhead for your complimentary copy, and see how other cities are using motorcycles to increase police efficiency.

HARLEY-DAVIDSON MOTOR CO.
MILWAUKEE WISCONSIN

Harley-Davidson

World's Champion Motorcycle

Municipal Finance

BONDING

ACCOUNTING

TAXATION

Some Things Which the Business Man Should Know About His City

By Thomas R. Lill

Of Searle, Nicholson, Oakley & Lill, Certified Public Accountants, New York

THE business man of the past, whatever he thought of his city as a political unit, did so in a contemplative manner, as though he were looking at a map showing the new territorial boundaries of the countries in Europe, as something aside and apart from his active interest. He regarded his contributions to the support of the city administration in much the same light as his contributions to the starving Belgians or to the Near East Relief.

The business man of to-day is showing increasing interest in the affairs of his home city, although it is to be regretted that this interest is frequently the result of his greatly increased contributions in the shape of taxes rather than of a realization of his duties as a citizen.

The cost of operating a city has, almost without exception, increased even more, proportionately, than has that of its business enterprises. Because of competitive features and the absolute necessity for profits in order to continue in business, the business man has been going through a period of deflation about as strenuous as the period of inflation, but not so exhilarating. Governmental deflation has not yet generally come about, and, to a very large extent, cities are spending more money now for current operations than ever before in their history. If business men desire to reduce their taxes, they must give the same quality of attention to the administration of their city affairs that they give to the administration of their own affairs.

A city is not an extraneous enterprise forced upon the public by an agent of his Satanic Majesty. It is merely a cooperative society of which each business man is a

member, formed for the purpose of providing certain services which can better be done through collective rather than individual effort. The administration of this cooperative society has become very highly specialized, and few business men have the requisite knowledge, even if they had the time, to make a comprehensive study of it and prepare a diagnosis of its afflictions.

Under these circumstances, the thing for the business man to do is to employ those who have specialized in the organization and administration of municipal government, just as he would employ a lawyer, a public accountant or an engineer in his own business. Such an undertaking requires the study of a large variety of subjects, such as the following.

Some Pertinent Questions

Is the form of corporate organization the best, and does it permit of effective and economical operation?

Is the personnel employed of good quality? And is it doing a day's work for a day's pay?

Are the rates of pay, from the mayor down to the scrubwoman, fair and in accordance with conditions prevailing in other lines of industry?

Are the streets being built with the type of pavement best suited to the kind of traffic using them? Are streets being repaired as they should be? Are they being cleaned as they should be?

How many policemen has the city, and how many should it have? How many firemen should it have?

Is adequate provision being made for schools and proper education of its citizens?



Comes Through in the Pinch

JUST a year ago this month New York City experienced one of the biggest snow storms in its history—and fought it to a standstill with the aid of 100 Cletracs. These never-tiring tractors worked 48 hours without a let-up to keep traffic moving. And they were successful—they *came through in the pinch*.

Cletrac is serving hundreds of cities and towns keeping streets and sidewalks clear of snow in winter and improving roads in summer. Its record will bear the closest scrutiny. Investigate this tractor's year-'round usefulness.

Your local Cletrac dealer will be glad to demonstrate, or write direct to us for further information.



HARD THIS WAY, BUT--



EASY ON A TRACK THE CLETRAC WAY

THE CLEVELAND TRACTOR CO.

Largest Producers of Tank-Type Tractors in the World
19205 EUCLID AVENUE CLEVELAND, OHIO

Are taxes being levied equitably? Or are some taxpayers paying more than they should while others pay less? Are taxes being collected promptly? Are interest and penalty being exacted from all delinquents alike without favoritism to any?

Has the city a storehouse? Does it buy materials and supplies in piecemeal or in bulk?

Does it buy in open competition or from a favored few? Are the specifications for contracts properly drawn up and are the contracts properly let by competitive bidding.

Has the city a purchasing agent to purchase for all departments of the city or does each department, bureau or office purchase its own supplies?

Is the movable property of the city properly protected and accounted for, or is it being lost through carelessness or other causes?

Does the city prepare and publish monthly the same kind of financial statements that the business man is accustomed to receive in connection with his own business?

What is the total debt of the city? Has the safe limit of borrowing been reached? Has proper provision been made for the repayment of the debt? Have the bonds issued been issued for proper periods?

It is safe to say that studies made of the various matters referred to, by trained specialists, will go far towards bringing about a more effective cooperation between the city administration and the city business man, with resultant reduction in taxes, and better service.

EDITORIAL NOTE.—The author of this article is a public accountant whose experience has not been confined to financial, manufacturing and commercial organizations, but has extended into the highest departments of governmental activities, national and municipal. His professional services have been availed of by many cities in questions involving finance, accounting and organization.

Municipal Bond News

AFTER the rapid advance which marked the closing weeks of the last year, the municipal bond market has stopped to catch its breath. The number of new issues shows a marked decrease, though the rates hold about at the levels reached in December. Such a sequence is entirely natural.

The city of Chicago has been the heaviest municipal borrower, with two issues—one of \$7,725,000 general corporation bonds, maturing serially, 1923-47, offered at a price to yield 4.40-4.50, the other of \$5,000,000 Sanitary District bonds, maturing serially from 1923 to 1941, with a yield of 4.30-4.60. Both of these issues carried a 5 per cent coupon.

The next largest issue during the month was that of Minneapolis, Minn., of \$2,295,000 improvement bonds. These carried a $4\frac{3}{4}$ coupon, mature from 1923 to 1952, and are issued to yield 4.35 to 4.65. Very few other issues exceeded the million-dollar mark. Among these are the following: \$1,000,000 Wheeling, W. Va., improvement 5's, 1930-53, to yield 4.60 to 4.75; \$1,000,000 Providence, R. I., $4\frac{1}{2}$ water bonds, due in 1962, to yield 4.10; \$1,850,000 El Paso, Tex., 5's, 1927-52, to yield 4.70 to 4.90; \$1,600,000 Indianapolis, Ind., 6 per cent World War Memorial bonds, due in 1927, to yield 4.65; \$1,000,000 Oakland School and High School District 5's, 1922-59, to yield 4.55 to 4.70.

Salt Lake City, Utah, also issued \$1,750,000 $5\frac{1}{2}$ anticipation notes due in December, 1922, to yield 4.75.

Of the smaller issues, that of Brookline, Mass., of \$241,000 for general improvements, is of particular interest on account of its low interest rate. Carrying a $4\frac{1}{4}$ per cent coupon, these were offered to yield from 3.90 to 3.95, as they mature serially from 1923 to 1941. This is the first time in many months that the 4 per cent line has been crossed.

It is of interest to note that comparatively few of the issues now appearing provide for retirement by means of a sinking fund. The serial bond is far more commonly met, seeming to meet with greater favor both among investors and with the issuing municipalities.

The Bond Market Twenty Years Ago

A pamphlet issued by Harris, Forbes and Company of New York gives an interesting list of municipal bonds being offered 20 years ago. The list shows the changes in the municipal bond market as compared with 1901. Of the 36 issues in the list, only 12 are serial bonds. The coupon rate was $3\frac{1}{2}$ or 4 in a majority of cases, a few being issued at 3 per cent and one at 6. These were offered to investors at rates ranging from 2.55 per cent for the lowest to 3.875 for the highest.



Fixing Up Chicago's Front Yard

*The "Caterpillar's" * field of usefulness is by no means limited to dirt moving and road making. For snow removal, hauling garbage disposal trains and other civic work—wherever power and endurance is at a premium, the "Caterpillar" * has no real competitor.*

After exhaustive investigation, the South Park Commissioners selected "Caterpillar" * Tractors for grading Grant Park, Chicago's famous front yard. With "Caterpillars" *, every phase of the work is being speeded up, greater daily yardages are being handled and real savings over other methods are being shown. It is significant that after a similar study of machines, methods and costs, "Caterpillars" * have been adopted by New York, Duluth, Memphis, Dallas, Minneapolis, Spokane and many other cities and towns for public works of all kinds where economy is the great essential. Let us arrange to show you our new motion picture, "Bureau County Knows How" or send you our booklet, "Caterpillar" * Performance."

**There is but one "Caterpillar"—Holt builds it*

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PEORIA, ILL.
STOCKTON, CALIF.

The City's Legal Rights and Duties

Information for City Attorneys and Other Municipal Officers, Summarizing
Important Court Decisions and Legislation

Conducted by A. L. H. Street, Attorney at Law

Municipal Censorship Powers Over Newspapers Defined

The right of a city to suppress the sale of specific newspapers on the streets while others are permitted to be sold is limited to prosecuting for consummated violations of an ordinance forbidding the sale of obscene, scandalous, etc., publications. The sale of a certain newspaper cannot be validly prohibited generally in such way as to operate as a censorship in advance of publication. These conclusions were reached by the United States District Court for the Northern District Court of Ohio in the late case of *Dearborn Publishing Co. vs. Fitzgerald*, 271 Federal Reporter, 479.

Holding that Henry Ford's *Dearborn Independent* was not an indecent, obscene or scandalous publication, within the meaning a Cleveland ordinance which forbids the sale of such publications, by reason of the *Independent's* attacks on the Jewish race, the Court said:

"The publication complained of cannot by any stretch of the imagination be classified as indecent, obscene, or scandalous; but, if it were, the limit of the city's power would be to conduct a prosecution for the specific offense thus committed, and not the establishment of a censorship in advance of future publications, and prohibition generally of the sale thereof upon the streets, in the same manner as other publications may be sold. That the real basis of defendants' action is not the indecent, obscene, or scandalous character of the publication is further evidenced by their action in permitting its sale at news-stands or in shops, without any effort to prosecute therefor; whereas, under section 1770, it would be as much an offense to sell at a news-stand or in a shop an indecent, obscene, or scandalous publication as it is to sell it upon the city streets.

"That the publication has a tendency to create breaches of the peace is equally without foundation in fact or in law. Assuming that section 1770 is sufficiently definite in this respect to be valid—an assumption which may well be doubted, in view of the adjudged cases . . . its language was never intended to apply to a newspaper article of the kind in question. The affidavits conclusively show that no disorder or excitement was created on the streets by the

sales in question. Nothing appears to indicate who were or might be excited by its sale to break the peace. It would be a libel, it seems to me, on people of the Jewish race to assume that they are imbued with such a spirit of lawlessness. If it be assumed that the article might tend to excite others to breaches of the peace against people of the Jewish race, the reply is plain. It is the duty of all officials charged with preserving the peace to suppress firmly and promptly all persons guilty of disturbing it, and not to forbid innocent persons to exercise their lawful and equal rights."

Award of Contract After Competitive Bidding Must Be According to Advertised Terms

An award by a public body of a contract for the doing of work or the purchase of supplies, made after advertisement and competitive bidding, must be according to the terms advertised to prospective bidders, so that all may be on the same footing. An advertisement for competitive bids to furnish a fire engine called for a truck with a pumping system and body to carry 1,250 feet of hose, "each part proposed to be furnished to be separately specified by the bidder and separately priced." Held, that the contract could not be awarded on a lump bid for the entire apparatus. (*New Jersey Supreme Court, Pew vs. Commissioners of Fire Dist. No. 1 in Chester Tp. et al.*, 114 Atlantic Reporter, 150.)

Municipal Bonds May Not Be Issued Unless Power to Do So Is Conferred by Legislative Authority

Holding that defendant city's charter was insufficient to authorize issuance of street improvement bonds covering the cost of paving street intersections, etc., where the city elected to pay the cost out of its general revenues, the Oklahoma Supreme Court said, in the case of *Byrum vs. City of Shawnee*, 200 Pacific Reporter, 183:

"It is well settled that municipal corporations cannot issue bonds or other like securities unless the power to do so is conferred by legislative authority, either express or clearly implied."



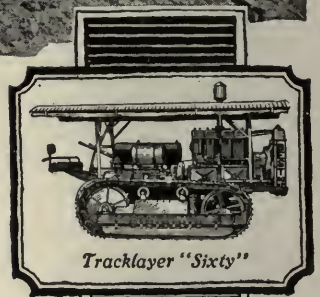
Cheaper power with tractors

Tractors are proving profitable equipment for road-builders in all parts of the country—profitable because of the time saved on a given piece of work, and because of the fewer hands required.

With a BEST TRACKLAYER TRACTOR the contractor can go ahead with his work in most any weather. He moves more earth and makes a better, smoother job. His power is steady, dependable, flexible and compact. He can negotiate grades without difficulty, and in faster time.

BEST TRACTORS have proven their mettle over a period of many years in all parts of the world. They have earned a reputation for dependability, power and low cost of operation. BEST design and workmanship have been established by time and the test of actual, practical usage on a large-variety of heavy-duty work.

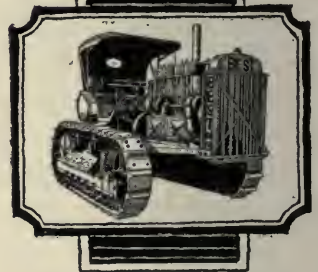
Write for full data, prices and the names of our nearest dealers. Let us give you the details of how Best Tractors are serving road-builders.



Tracklayer "Sixty"



Tracklayer "Thirty"



"Cruiser" (60)



C. L. BEST TRACTOR CO.
SAN LEANDRO, CALIFORNIA

There are three models of Best Tracklayer Tractors as shown above. All are factory built—not assembled

Municipal Contractor is Not Responsible for Defects in Plans Not Prepared by Him

A contractor constructing a reservoir for a city under plans and specifications furnished him by the city was not responsible for insufficiency of the work resulting from a defect in the plan arising from the character of the soil of the site. Reaching this conclusion in the case of Walsh Construction Co. vs. City of Cleveland, 271 Federal Reporter, 701, the United States District Court for the Northern District of Ohio said:

"The site was selected by the city. The plans and specifications were designed and prepared by the city. The entire design of the reservoir was prepared by the city. The contractor was bound to furnish material and perform labor only in constructing a reservoir of that design and upon that site, without any power to modify the designs or plans to meet unexpected conditions. If the contractor should undertake so to do in order to produce a better structure, such, for instance, as providing pile foundations or making the concrete bottom or walls of additional thickness, the work would have been wholly outside of his contract and contrary to the plans and specifications. The contractor, neither expressly nor impliedly, guaranteed or warranted that a reservoir constructed on that site and according to the design and plans would answer the purpose for which it was intended. The city or its officials could make changes, if any were deemed necessary to correct the faults of the design; but the contractor was not at liberty so to do. The contractor was bound to build as had been agreed and as he was from time to time directed. The contractor here is not in the position of one who undertakes to construct a building or to produce a given result and has free choice of the means whereby that result may be accomplished. In cases of this character it is settled law that if a contractor performs his contract according to the plans and specifications, he is not responsible for the failure of the structure because of faulty design, or because the structure as designed and built will not answer the purpose for which it was intended."

Not Negligence to Permit Pole Necessary for Public Convenience to Be Erected Within Street Limits

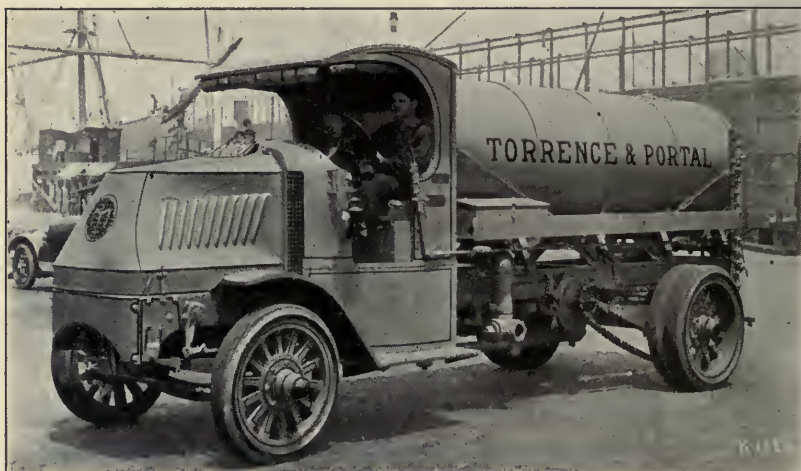
Holding that neither the city of Biloxi nor a traction company was liable for the death of a motor-cyclist who collided with a guy wire post maintained in a street in connection with the traction company's trolley system, the Mississippi Supreme Court said in the case of Gulfport & Mississippi Coast Traction Co. vs. Manuel, 85 Southern Reporter, 308:

"It is insisted by the plaintiff that it was negligence for the city and the traction company to erect within the limits of the street the poles in question; that the street must be kept in a reasonably safe condition for travel. While the streets must be used for public purposes, it is not necessary for the entire space to be kept in condition for travel. The city may lawfully use the street for the construction of sewers, for drainage, to lay gas or water pipes, or to erect poles or string wires for electric lights, or to construct a wharf at the terminus of the street, or convert a promenade into wharves, or set apart for a boulevard a portion of a street not devoted to business purposes. 28 Cyc. 853.

"It is permissible for the city to set apart a portion of the street for the erection of poles to support light, telephone, and trolley wires. The electric street car system is a convenience and necessity which serves the public interest, and it is not negligence to erect poles between the sidewalk and the traveled parts of the street. The traveled part of the street was practically 18 feet wide and is sufficient for the travel according to the record before us. The pole in question was located some 2½ feet beyond the edges of the traveled way as ordinarily used by the traveling public. The extent of the obligation of the city in working its streets is to keep them reasonably safe for general use. It is not required to have them in such condition as to insure the safety of reckless drivers. . . . A user of vehicles is not entitled to the entire street from property line to property line. The street not only serves the needs of the traveling public, but serves also the purpose of furnishing the public the conveniences above set out."

Railroad Employee Held Disqualified Under Statute to Hold Municipal Office

Where a railroad company uses certain streets and alleys in a city under ordinances granting it the right to occupy them with its tracks upon condition that it shall conform to certain requirements including the keeping the track in good condition with respect to general travel, the paving of the track between the rails, and the maintaining of a driveway and sidewalk for the public, one who is employed by such company as a boiler maker is disqualified to hold the office of city commissioner, under a statute which provides that no employee of a railway corporation operating under a franchise granted by a city, or having any contract with it, shall hold any city office. The term "franchise" is used in such statute in a broad and general rather than a narrow and technical sense, and covers rights acquired under such ordinances, and the relations of the city and railway company under such ordinances are contractual. (Kansas Supreme Court, State vs. Grove, 201 Pacific Reporter, 82.)



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Your road maintenance next Spring



Now is the time to get ready

INCLUDED in our unusual line of special motor-
I zed equipment for municipalities, counties
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This equipment is a fool-proof machine for hand-
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operator which is usually needed on ordinary
machines, means economy for its owner.

The tank body can be demounted when its particular work
is done and a dump body substituted. This continuous
chassis use effects large savings and many highway boards
and commissioners are finding this a practical way to
economize on their road maintenance equipment.

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Capacities:

1½ to 7½ tons.

Tractors to 15 tons.

PERFORMANCE COUNTS

Ordinance Requiring License for Business of Selling or Delivering Soft Drinks—Held Void

In the case of *Village of Westville v. Rainwater*, 128 *Northeastern Reporter*, 492, the Illinois Supreme Court declared the following ordinance to be void, as applied to one engaged in delivering soft drinks to retail dealers:

"It shall be unlawful for any person, firm or corporation in said village, either by himself or agents, or for any agents, dispensers, clerks, servants or other persons, to sell any malt, cereal, grain or fruit beverages, extracts or substitutes thereof, or to sell or offer for sale any ice cream, ice cream sodas, pop or ginger ale, or any other drinks known as soft drinks, without first having obtained license to do so, which said license shall be known as a retail soft drink license. It shall be unlawful for any person or persons to deliver any of the above-mentioned articles, or act as agents or dispensers of the same, without first having obtained a license which is hereby denominated as a wholesale license; provided, that nothing herein contained shall be construed as operating to grant the right to sell beverages containing more than one-half ($\frac{1}{2}$) of one (1) per cent alcohol."

The gist of the opinion of the Court is as follows:

"The health, safety, welfare, and comfort of the population of cities and villages are proper subjects for the exercise of the police power, and under a delegation of the power they may regulate any occupation or business the unrestrained pursuit of which might injuriously affect the public in the respects mentioned, but ordinances requiring a business or occupation to be licensed must in some degree tend toward the prevention of some evil, and have for their aim the protection of the public health, safety, morals, or welfare. *Wilkie v. City of Chicago*, 188 Ill., 444, 58 N. E. 1004, 80 Am. St. Rep. 182. What kind of business or occupation injuriously affects the public interests is primarily for the consideration of the municipal authorities, but the power to control or regulate must be expressly or impliedly delegated and be exercised in good faith and within reasonable bounds. The business of delivering to the purchaser beverages containing less than one-half of 1 per cent alcohol by volume was a lawful business, and the authority to require appellee to take out a license is not expressly or impliedly conferred on municipalities by the Cities and Villages Act.

"In this decision we have not considered the power of the municipality to require the person who keeps a place for the retail of soft drinks to customers to take out a license. That question is in no way involved, for the only business appellee was engaged in was driving a truck for the delivery of non-intoxicating beverages to the retail dealer."

Municipality May by Ordinance Regulate Pool-Rooms and May Require Written Applications and Bonds for License

The decision of the Georgia Supreme Court in the case of *Purvis v. City of Ocilla*, 102 *Southeastern Reporter*, 241, deals with the validity of various municipal measures designed to keep public pool- or billiard-rooms in proper subjection. The Court lays down the following propositions:

The operation of such places is subject to strict regulation under the police power. But where there is charter power merely to regulate—not prohibit—their operation, that power must be exercised reasonably. And a clause in an ordinance limiting the operation of pool- or billiard-rooms to a certain district will be held to be void where it appears that it is intended as a virtual prohibition against the operation of such places.

But a licensing ordinance may require written application for a license to be filed, the giving of bond conditioned to keep an orderly room, observe all local regulations, and pay any fines assessed for their violation.

And, under the usual general welfare clause, a municipality may provide that such establishments shall not be kept open between the hours of 7 p. m. and 6 a. m., nor on Sundays or holidays.

A provision making it unlawful to sell merchandise in a pool-room, or to conduct any other business, trade, or calling there, is reasonable.

An annual license tax (as distinguished from a tax for revenue) of \$125 on the first table, \$100 on the second, and \$75 on each additional table operated is not invalid as being excessive.

City in Improving Street Bound to Guard Against Heavy Rainfall

In improving a street and thereby diverting the flow of surface water, a city is bound to foresee the consequence of a heavy rainfall in flooding private property, and guard against it, where the overflow reasonably may be expected and anticipated, although rainfalls of such severity may be infrequent. (*North Carolina Supreme Court, Shaw v. City of Greensboro*, 101 *Southeastern Reporter*, 27.)

THE AMERICAN CITY

General Motors Trucks



BUFFALO POLICE PATROLS TELL THEIR OWN STORY

"Because of the low repair cost of the first GMC truck purchased for the Police Department, we have added five others," says Mr. Henry W. Alt, Superintendent of motive power of the Buffalo Police Department.

"Our first GMC was purchased in November, 1917. During its first year of operation the total cost of repairs was \$19.00 which is about 25 per cent of the lowest cost of any of our other trucks during the same period. Encouraged by this splendid record, we purchased five more GMC's and put them in our sub-stations for patrol wagons.

"The original GMC is equipped as an electrical repair wagon and takes care of all the repairs on the electrical equipment used by the police department. It has been given extremely hard usage, standing up remarkably well.

40 Miles Daily

"The five newer GMC trucks are equipped with standard patrol wagon bodies. They operate from the police stations in different parts of the city and answer calls when arrests are made. In the morning they take prisoners to and from court to the penitentiary or out to the farm. These trucks operate seven days a week

and average about 40 miles a day. They are certainly well suited for their work and we have found them very dependable."

GMC trucks are designed and built to meet hauling problems. Not only are they trucks of established ability, but they are far in advance of the general trend of motor truck design in their features of construction which make for more economical operating costs and rapid and inexpensive replacements.

Many Improvements

With such improvements as the new two-range transmission, removable cylinder walls, pressure lubrication, removable valve lifter assemblies, instantaneous centrifugal governor, and dual cooling system, GMC trucks offer the motor truck user every possible advantage. Moreover the complete line of GMC trucks from one to five tons capacity has recently been reduced in price in keeping with the spirit of the times and substantial reductions also have been made upon all service parts.

Write direct to the factory or ask your GMC dealer for detailed information about GMC trucks.

GENERAL MOTORS TRUCK COMPANY

Division of General Motors Corporation

Pontiac, Michigan

DEALERS AND SERVICE IN PRINCIPAL CITIES

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Municipal and Civic Publications

Prices do not include postage unless so stated

DRAINAGE AND SANITATION

E. H. Blake, Vice-President, Institution of Sanitary Engineers, London, England. D. Van Nostrand Company, New York City. 1921. Second Edition. XII + 519 pp. 379 illustrations. \$4.50.

An interesting book on domestic sanitation, including the planning, construction, and prevention of dampness in buildings; their ventilation, heating and lighting, and water-supply; sanitary fittings and waste pipe; exterior and interior drainage; sewage disposal; the materials used in sanitary work; sanitary surveys and reports; refuse disposal; disinfection and smoke abatement. There is also a chapter of legal notes regarding statutory enactments governing sanitary matters in England.

PLUMBING FIXTURE TRAPS—VENTED AND UNVENTED TRAPS

A. E. Hansen, Hydraulic and Sanitary Engineer, 2 Rector Street, New York, author and publisher. 1921. 83 pp. Illustrated. \$2.00.

This book has been prepared as the result of an historical, statistical and experimental engineering research on vented and unvented traps. It gives a very detailed discussion of the history, uses and value of the various types of traps in use in the United States to-day. Tables are included showing the types of traps permitted in different cities. The book is particularly valuable for the municipal official or the department which has in mind the revision of its plumbing code.

BUDGET MAKING

Arthur Eugene Buck, of the National Institute of Public Administration and the New York Bureau of Municipal Research. D. Appleton and Company, New York. 1921. VII + 234 pp. \$3.00.

This volume presents a comprehensive discussion of the methods of budget making with illustrations drawn from state and city budget practices. It contains a set of model estimate forms and exhibits of the essential statements of the budget document. Although designed with special reference to states, it is equally applicable in principles to the preparation of municipal budgets.

PRINCIPLES OF PUBLIC PERSONNEL ADMINISTRATION

Arthur W. Proctor. Published for the Institute for Government Research. D. Appleton and Company, New York. 1921. 242 pp. \$3.00.

The author has long been connected with the study of problems of personnel administration, as a member of the late President's Commission on Economy and Efficiency, the New York Bureau of Governmental Research, and the Institute for Government Research. The volume has been prepared as a guide to the study of the subject, and includes the state and municipal as well as the Federal and civil service. The chapter on "The Conduct of a Standardization Inquiry" covers a most important phase of municipal administration.

PENOLOGY IN THE UNITED STATES

Louis N. Robinson, Ph.D., Chief Probation Officer, Municipal Court of Philadelphia, Pa. The John O. Winston Company, Philadelphia. 1921. 344 pp. \$3.00.

A comprehensive work by a well-known authority on penology. It discusses in detail such topics as jails, penitentiaries, reformatories, prison labor and compensation, and probation and parole. The chapters on jails and the probation and parole systems will be of especial interest and value to municipal officials.

COMMUNITY LIFE AND CIVIC PROBLEMS

Howard Copeland Hill, Head of the Department of Social Science, University of Chicago High School. Ginn and Company, Boston, Mass. 1921. XX + 528 pp., index and appendix. Illustrated. \$1.40.

This book is in the nature of a civics textbook, large parts having been used for some time, in mimeographed form, in the laboratory schools of the University of Chicago. It is also well suited for evening school work, especially before classes of aliens preparing for citizenship.

RURAL COMMUNITY ORGANIZATION

Augustus W. Hayes, Assistant Professor of Sociology, Tulane University, of Louisiana. Published by The University of Chicago Press, Chicago, Ill. 1921. XI + 127 pp. Maps. \$1.50.

The author discusses the organization of such units as the Trade Area, the Rural School District, and the Consolidated School District.

COMMERCIAL REGISTER OF THE UNITED STATES

30th Edition, S. E. Hendricks Company, Inc., New York. 2,324 pp. \$12.50.

Published in the standard size of 8½ x 11½ inches, Hendricks' Commercial Register is even more valuable than before. Its lists completely cover the electrical, engineering, machinery, building, manufacturing, chemical and similar industries. This book is comprehensive, well arranged, and thoroughly indexed for instant reference, and is an invaluable guide in purchasing and selling.

MARKETING AGRICULTURAL PRODUCTS

Benjamin H. Hibbard, Ph.D., Professor of Agricultural Economics, University of Wisconsin. D. Appleton and Company, New York. 1921. XV + 389 pp. \$2.50.

A timely volume on a subject of great importance. It includes an expert analysis of the growing cooperative movement, giving accomplishments and prospects.

CITY PLANNING IN HAMILTON, OHIO

"The City Plan of Hamilton, Ohio." Published by the Chamber of Commerce. 66 pp. Maps and Illustrations. 1920. Description of the plan prepared by Harland Bartholomew, of St. Louis. (Apply to Louis H. Frechtling, Secretary, City Planning Commission, Hamilton, Ohio.)

THE PROPER LOCATION OF A CITY HALL

"Report on Proposed Location for Town Hall, Together with Other Changes Suggested in Watertown Square." Prepared by John Nolen, Town Planner, Cambridge, Mass. A survey made for Watertown, Mass. 14 pp. and map. 1921. (Apply to John Nolen, Harvard Square, Cambridge, Mass.)

COMMUNITY TRUST FOR NEWARK

"Community Trust for Newark and Its Vicinity," published by the Fidelity Union Trust Company, Trustee, Newark, N. J. 21 pp. Describes the organization and purpose of the trust. (Apply to publishers.)

NEW JERSEY INDUSTRIES

"Industrial Opportunities in New Jersey," published by the Land Registry, Department of Conservation and Development, State House, Trenton, N. J. 32 pp. Maps and illustrations. Describes the facilities of the state and its resources. (Apply to L. G. Gillam, Chief, Land Registry, address above.)

ROAD BUILDERS' ASSOCIATION

"Proceedings of the Eighteenth Annual Convention of the American Road Builders' Association," held at Chicago, Ill., February 9-12, 1921. Published by the American Road Builders' Association. 154 pp. Complete proceedings with lists of officers and directors. (Apply to the American Road Builders' Association, 11 Waverly Place, New York, N. Y.)

FEDERAL ROAD BUILDING

"The Organization and Work of the U. S. Bureau of Public Roads." Published by the American Road Builders' Association, 11 Waverly Place, New York, N. Y. 47 pp. Illustrated. 1922. (Apply to publishers.)

STIMULATING SCHOOL ATTENDANCE

"Better Attendance in Delaware Schools," being a series of newspaper articles and statistical tables used during School Attendance Week to emphasize the need of better attendance in Delaware Schools. Prepared by Richard Watson Cooper, Director, Bureau of Education, The Service Citizens of Delaware, and published by them. 62 pp. 1921. (Apply to H. V. Holloway, State Superintendent of Public Instruction, Dover, Del.)

KINDERGARTENS

"The Housing and Equipment of Kindergartens." Published as Bulletin No. 13, Department of the Interior, Bureau of Education. 27 pp. 1921. 10 cents. This bulletin was prepared with the cooperation of a committee of the International Kindergarten Union, Miss Grace L. Brown, Chairman, and with the help of Miss Grace M. Janney. (Apply to P. P. Claxton, Commissioner, Department of the Interior, Bureau of Education, Washington, D. C.)

CITY PLANNING IN BRISTOL, CONN.

"Local Survey and City Planning Proposals for Bristol, Conn." 35 pp. Maps. 1920. Account of plans prepared by John Nolen, of Cambridge, Mass. (Apply to Joseph F. Dutton, Mayor, Bristol, Conn.)

Plan Now for that Street Flusher—

All the cities that are likely to require Street Flushing Apparatus this year will find it hard to get equipment, if they defer the matter until after winter abates.

Much new pavement is being built, — pavement which should be protected by proper cleaning.

The sanitary way and the way of greatest economy is by flushing with water.

The machine that has shown itself most effective, most economical and most durable, is the TIFFIN TWO-MOTOR-SYSTEM FLUSHER.

Start to make your arrangements now for that flusher.

TIFFIN Combination Flusher and Sprinkler

Licensed under Ottogy Pat. No. 795059

Let us submit data and specifications, records and references. It will certainly pay you to act now.

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Makers, also, of Tiffin Municipal Trucks, Dump and Farm Wagons, etc., etc. Representatives in Principal Cities.



MODERN SCHOOL BUILDINGS

"Concrete School Houses," published by the Lehigh Portland Cement Company, Allentown, Pa. 12 pp. Illustrated. Describes the advantages of concrete for construction of this sort. (Apply to publishers.)

MUNICIPAL BUDGETS

"City Budget Facts," based upon the official estimates of the city of Toronto. Issued by the Toronto Bureau of Municipal Research. 28 pp. 1921. Detailed presentation of the Toronto Budget, with graphic analysis. (Apply to Bureau of Municipal Research, 189 Church Street, Toronto, Ont.)

CHARITY IN CHICAGO

"Charity Service Reports," of Cook County, Ill. 336 pp. Illustrated. For the fiscal year 1920. Includes reports of the Department of Poor Relief, the County Hospital, the Institutions at Oak Forest, the Juvenile Detention Home, the Bureau of Social Service, and the Adult Probation Department, together with the annual message of the President of the Board of Commissioners of Cook County. (Apply to Robert M. Sweitzer, Clerk of the Board of Commissioners of Cook County, Chicago, Ill.)

MUNICIPAL FORESTRY

"The Forest Preserves of Cook County, Ill.," prepared by the Board of Forest Preserve Commissioners of Cook County. 223 pp. Illustrated. 1921. Descriptions of the Preserve and the activities centered there. (Apply to William Gornley, Secretary, Board of Forest Preserve Commissioners of Cook County, Chicago, Ill.)

TRACTION PROBLEM IN CHICAGO

"A Discussion of the Traction Problem in Chicago, with a Proposal of a Financial Plan for Municipal Acquisition of the Properties and the Operation Thereof." Submitted by Ulysses S. Schwartz, Chairman, Committee on Local Transportation, City Council of Chicago. 35 pp. 1921. (Apply to author, City Hall, Chicago, Ill.)

UNEMPLOYMENT RELIEF FOR CHICAGO

"An Appeal to Business Men," being suggestions for providing work for the unemployed, with special reference to the relation of national prosperity to city planning, and the relations between business and the Chicago Plan, by Charles H. Wacker, Chairman, Chicago Plan Commission. 18 pp. 1921. (Apply to author, Chicago Plan Commission, Hotel Sherman, Chicago, Ill.)

FORESTRY IN NORTH CAROLINA

"The Forest Problem in North Carolina," by W. Darrow Clark, Chief Forest Fire Warden. Published by the North Carolina Geologic and Economic Survey as Circular No. 1. 14 pp. 1922. A discussion of forest fires and their prevention. (Apply to author, Chapel Hill, N. C.)

THE PROPER CONSTRUCTION OF CHIMNEYS

"An Ordinance for the Construction of Chimneys," suitable for use in cities and towns of any size, or as a state law. Recommended by the National Board of Fire Underwriters, Committee of Construction of Buildings. Second Edition, revised. 20 pp. Illustrated. 1921. (Apply to Ira H. Woolson, Consulting Engineer, Na-

tional Board of Fire Underwriters, 76 William Street, New York, N. Y.)

A SURVEY OF EDUCATION IN THE UNITED STATES

"Higher Education," by George F. Zook, Specialist in Higher Education, Bureau of Education, Department of the Interior. Published as Department Bulletin No. 21. 45 pp. 1921. 5 cents. These are advance sheets from the Biennial Survey of Education in the United States, 1918-20. (Apply to author, address above.)

INDUSTRIAL CONDITIONS IN NEW YORK STATE

"The Industrial Bulletin," issued monthly by the Industrial Commissioner of New York State, Vol. 1, No. 1, October, 1921. This is a combination of the Bulletin of the State Labor Department and the Labor Market Bulletin. (Apply to Victor T. Holland, Editor, The Industrial Bulletin, Albany, N. Y.)

PROGRESS IN AMERICAN COMMUNITIES

"A Hundred Milestones of Commercial Organization Progress." 1921. 64 pp. The stories of one distinctive achievement in each of a hundred American communities within a year, told by the Secretaries, at the Seventh Annual Meeting of the National Association of Commercial Organization Secretaries, New Orleans, October, 1921. (Apply to R. H. Faxon, Secretary, the Mississippi Valley Association, New Orleans, La.)

NATIONAL ASSOCIATION OF COMMERCIAL ORGANIZATION SECRETARIES

"Proceedings of the Seventh Annual Meeting of the National Association of Commercial Organization Secretaries," at New Orleans, La., October 24-26, 1921. 294 pp. Complete proceedings, with list of those in attendance. (Apply to John E. Northway, Secretary-Treasurer of the National Association, Secretary, Chamber of Commerce, Hamilton, Ohio.)

SOCIAL SERVICE IN CINCINNATI

"Community Responsibility," a review of the Cincinnati Social Unit Experiment, by Courtenay Dinwiddie, with statistics of Health Services in the Unit District, by Bennet L. Mead. Published by the New York School of Social Work, 105 East 22nd Street, New York, N. Y. 1921. 171 pp. 35 cents, postage included. A monograph on the experience of the Social Unit in Cincinnati during the three years ending July 1, 1920. Although this experiment terminated some time ago, no such complete account has hitherto appeared. (Apply to publishers.)

RURAL DEVELOPMENT

"Lifting the Country Community by Its Own Bootstraps," by Nat T. Frame, Director Agricultural Extension, College of Agriculture, West Virginia University, Morgantown, W. Va., in cooperation with the United States Department of Agriculture. Published as Circular No. 255 of the Extension Division. October, 1921. 15 pp. Illustrated. Gives method of scoring country communities, especially for use in connection with country life conferences. (Apply to author, address above.)

Municipal Reports

Baltimore, Md.—Annual Report of the Comptroller of Baltimore City for the fiscal year ending December 31, 1920. (Apply to Peter E. Tome, Comptroller, Baltimore, Md.)

Cleveland, Ohio.—Third Annual Report of the Board of Park Commissioners of the Cleveland Metropolitan Park District, for the year 1920. (Apply to Stephen H. Hazelwood, Secretary, Board of Park Commissioners, Old Court House, Cleveland, Ohio.)

Erie, Pa.—Fifty-fourth Annual Report of the Commissioners of Water Works, for the year ending December 31, 1920. (Apply to George C. Gensheimer, Secretary, Commissioners of Water Works, Erie, Pa.)

Fitchburg, Mass.—Third Annual Report of the Commissioner of Public Works, for year ending November 30, 1920. (Apply to David A. Hartwell, Commissioner of Public Works, Fitchburg, Mass.)

Greenwood, S. C.—Twenty-second Annual Report of the Water and Electric Light Plant, for the year ending December 31, 1921. (Apply to A. J. Sproles, Superintendent, Greenwood, S. C.)

Louisville, Ky.—Annual Report of the President, Board of Park Commissioners for the fiscal year ended August 31, 1921. (Apply to Harry G. Evans, Secretary, Board of Park Commissioners, 601 Columbia Building, Louisville, Ky.)

New Orleans, La.—Forty-second Semi-annual Report of the Sewerage and Water Board for the period ending December 31, 1920. (Apply to George G. Earl, General Superintendent, Sewerage and Water Board, City Hall Annex, New Orleans, La.)

Newport, R. I.—Annual Report of the Highway Department, for the year 1920. (Apply to John F. Sullivan, Street Commissioner, Newport, R. I.)

Newton, Mass.—Annual Report of the Chief of Police, for the year ending December 31, 1920. (Apply to Frederic M. Mitchell, Chief of Police, Newton, Mass.)

New York, N. Y.—Preliminary Report of a Special Committee of the Board of Estimate and Apportionment concerning the Brooklyn-Richmond Freight and Passenger Tunnel. (Apply to Arthur S. Tuttle, Chief Engineer, Board of Estimate and Apportionment, New York, N. Y.)

Pasadena, Calif.—Fourteenth Annual Report of Pasadena's Municipal Lighting Works Department for the year ending June 30, 1921. (Apply to C. W. Koiner, City Manager, Pasadena, Calif.)

Philadelphia, Pa.—Annual Report of the Bureau of Surveys, Department of Public Works, for the year 1920. (Apply to Charles Frommer, Acting Chief Engineer, Bureau of Surveys, Philadelphia, Pa.)

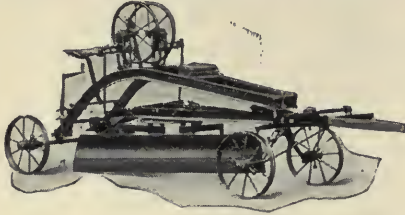
Philadelphia, Pa.—Fifteenth Annual Report of the Civil Service Commission, for the year ending December 31, 1920. (Apply to Charles J. Shaughnessy, Chief Examiner, Civil Service Commission, 875 City Hall, Philadelphia, Pa.)

Philadelphia, Pa.—Seventh Annual Report of the Municipal Court, for the year 1920. (Apply to Frank S. Drown, Statistician, The Statistical Department, Philadelphia, Pa.)

St. Paul, Minn.—Annual Report of the Commissioner of Public Works for the year ending December 31, 1920. (Apply to H. C. Wenzel, Commissioner of Public Works, St. Paul, Minn.)

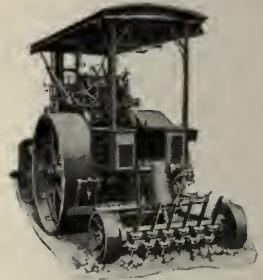
Wilmington, Del.—Fifty-first Report of the Board of Water Commissioners, for the fiscal year 1919-1920. (Apply to James I. Ford, President, Board of Water Commissioners, Wilmington, Del.)

Write for Your Copy



The Winner Highway Patrol Road Grader

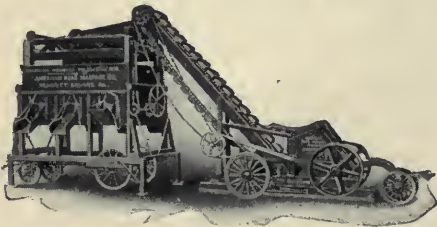
A one-man two-horse machine for maintaining dirt and gravel roads in the most economical manner. Weight 1150 pounds. Blade 6 feet long. We make the Winner Grader in many different sizes.



The Monarch Steam Road Roller

with Steam Pressure Scarifier. A Durable and Serviceable three-wheeled 10-ton Roller.

The most complete catalogue of Road Building Machinery ever issued. A copy is yours for the asking



Champion Steel Rock Crusher

Mounted with Elevator, Screen and Portable Stone Bin. An ideal crushing plant for townships, counties and contractors.



Keystone Corrugated Metal Culvert Pipe

Made in many sizes.

Guaranteed for 25 years.



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Methods, Materials and Appliances

News for City and County Engineers, City Managers, Water-Works Superintendents, City Controllers, Park Superintendents, Purchasing Agents, and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

Preparing and Certifying Municipal Bonds

By Frank J. Parsons

Vice-President, United States Mortgage & Trust Company

ONE of the notable developments of the past twelve months has been the revival of activity in all classes of bonds, and the growing desire of investors to avail themselves of opportunities for placing their funds in sound securities yielding an attractive return, before the cost of money shall recede approximately to the level of former decades. Of no class of investments has this been more true than of municipal bonds. Twenty years ago the highest net yield obtainable from conservatively selected securities of this class ranged from 2.55 per cent to 3.875 per cent. To-day it is entirely possible to secure $4\frac{3}{4}$ per cent to $5\frac{3}{4}$ per cent with equal safety. The present trend toward lower money rates points clearly, however, to the fact that the period of high-interest-bearing bonds is rapidly passing.

There has never been a time when the preference of executors, trustees, savings banks and insurance companies for sound "municipals" has been more marked than at present. The reason is not far to seek. In point of security and marketability these issues rank next to national and state bonds. In addition, their exemption from Federal and other income taxation constitutes a strong appeal to the investor. The vital importance of surrounding with every possible safeguard the holdings of estates, individuals and life insurance companies, made up as they are so largely of municipal bonds, requires no demonstration, and is being more and more insisted upon, not only by investors and by bond houses, but by the municipalities themselves.

A consideration of the numerous cases of forgery and fraud in this respect induced the United States Mortgage & Trust Company some twenty-five years ago to inaugurate a plan for preparing and certifying municipal bonds which would safeguard not only the municipality but the reputable dealer and the investing public as well, while relieving the municipal official in charge of all detail in connection with their preparation.

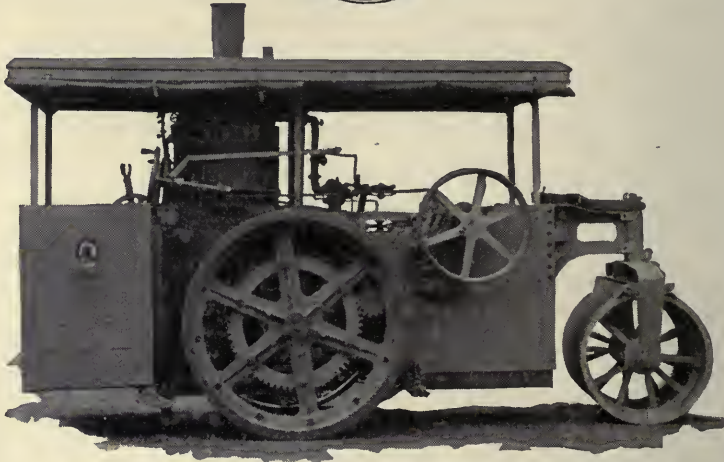
In 1893 and 1894 the Quigley forgeries were perpetrated, involving securities of several cities, and were so cleverly executed that they were accepted as collateral for loans by New York banks. Again in 1906 the Prior forgeries, comprising bonds of cities in three states and

aggregating \$1,200,000, were discovered, and again during the years 1919 and 1921 the importance of the certification by responsible disinterested parties such as a trust company, has been further emphasized by the disclosure of a fraud perpetrated by a Chicago bond dealer who forged securities amounting to \$600,000, and a Spokane bond dealer whose forgeries amounted to \$350,000. The victims numbered prominent banking houses as well as individual investors, and the early success of the forgeries was due primarily to the fact that insufficient care was given to the matter of preparing and certifying the bonds which they had bought from the issuing municipalities.

It will be noted that a further motive for the company's activities in this field has been a desire to raise the material standard of preparation of such issues, many municipalities having in the past been contented with a carelessly printed or lithographed bond easily forged and presenting an unattractive appearance to discriminating purchasers. In this it is believed that a measurable amount of success has been attained, and while the work done has been but a small part of the total, the general standard of preparation has been raised.

With a view to further standardization of the details surrounding the issuance of municipal bonds and as a matter of convenience for municipalities, dealers and attorneys, this company in 1917, following a close association with leading members of the Investment Bankers Association, consented to act as the official depository for legal papers and opinions rendered in connection with municipal bond issues. The number of attorneys' opinions and legal papers now on file with this company aggregate some thousands, and the files are constantly being added to. Under this plan it is possible for any member of the Investment Bankers Association to procure promptly and at small cost certified copies of opinions and legal papers which would otherwise be difficult and sometimes impossible to obtain.

The United States Mortgage & Trust Company places at the disposal of such officials in all parts of the country the benefits of its experience, facilities and service in the satisfactory handling of their problems of this nature.



New Iroquois Macadam Roller

Easy to operate—easy to repair *and chock full of power*

That's why the New Iroquois Macadam Roller ends macadam roller troubles. It was designed by engineers who use street and road-building equipment.

The working parts of the New Iroquois are not just hung together. *Each is a separate unit resting on a steel frame.* Rack and strain, especially on the boiler, are thus eliminated.

The New Iroquois Macadam Roller was built to stand hard service. Its great power comes from higher steam pressure and larger engine cylinders.

Write now for details regarding this wonderful roller. If you need a roller at once, a telegram will start a New Iroquois to you without delay.

The Iroquois line includes every tool needed in asphalt paving work. Ask for Bulletins Nos. 8, 6 and 5.

Iroquois Sales Department.

New York
Chicago
Pittsburgh

THE BARBER ASPHALT
COMPANY
PHILADELPHIA

St. Louis
Kansas City
Atlanta
San Francisco



A New Street Lighting Unit

The Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has recently developed a highly efficient post top of novel design for use with Mazda "C" Lamps, in which upper and lower parabolic reflectors are used to direct the light on to the plane of illumination. The quality of the light emitted by the Reflecto-Lux units is brilliant and sparkling, and they have been designed to distribute a flood of light on the streets, with a small amount upwards to light the fronts of the adjacent buildings.

The maximum light is emitted at approximately 20 degrees below the horizontal, and the distribution is ideal for mounting heights and spacings customary with ornamental street lighting. The distribution is obtained by upper and



A LIGHT TOP OF NOVEL DESIGN

lower parabolic reflectors, which direct the light outwards, and, in addition, a portion of the light in the upper hemisphere is redirected by an opal glass band around the upper hemisphere of the lamp, or by a band of enamel on the lamp itself.

The construction of the Reflecto-Lux units is rugged, the frame is of galvanized cast iron, and the glass panels are set in felt gaskets, making the whole thoroughly dust-proof. In the post top, the lamp burns in a "tip up" position and is readily accessible for cleaning and replacement through the hinged top cover. In the pendant unit, the lamp burns "tip down," and access is obtained to the interior of the lantern through the bottom casting, which is hinged.

Street Lighting at Miami Beach, Fla.

On page 465 of the December, 1921, issue of THE AMERICAN CITY, appeared an attractive illustration bearing the caption "A Light Stand-

ard Located on the Sidewalk and Harmonizing with the Surroundings at Miami, Fla." We are advised by Charles W. Chase, Sr., Associate Secretary, Miami Beach Chamber of Commerce, Fla., that this photograph was taken at Miami Beach and not in Miami, Fla.

Landscape Architect's Work on Private Estates

B. Ashburton Tripp, landscape architect and town planner, Cleveland, Ohio, has been engaged to design the estate of Don A. Goodwin, hotel owner, of Akron, Ohio, at Silver Lake Village, and also to lay out the estate of E. Arthur Ball of the Ball Glass Manufacturing Company, Muncie, Ind.

Mt. Clemens' New Street Lighting System

Mt. Clemens, Mich., has recently completed the installation of an attractive White Way system, with an appropriate celebration on the opening night. An extensive program of festivities was arranged to initiate the turning on of the boulevard lights over $3\frac{1}{2}$ miles of the city streets. The standards for these lights were furnished by the King Manufacturing Company, 53 West Jackson Boulevard, Chicago, Ill.

The first electric lighting in Mt. Clemens was in the fountain bath-house and was furnished by a small electric light plant installed by R. O. Meldrum & Sons in 1888. On December 16, 1889, an ordinance was passed authorizing the establishment of electric works in the city, with permission to use the streets for poles and wires. The capacity of the first plant consisted of one 500-candle-power generator of the single-phase, alternating-current type, and one direct-current series generator machine of a capacity of 30 lights. From that time the use of electric current in the city has increased and the appreciation of well-illuminated streets has grown, until this past fall boulevard lights were installed, much to the delight and satisfaction of the taxpayers.

Merger of Pipe Companies

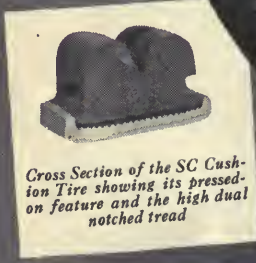
An agreement has recently been reached between the East Jersey Pipe Company, 7 Dey Street, New York City, and the Riter-Conley Company, Leetsdale, Pa., whereby Lock-Bar steel pipe, which has been exclusively controlled by the East Jersey Pipe Company since its introduction in this country in 1905, and has been hitherto manufactured by the East Jersey Pipe Company at its plant at Paterson, N. J., will hereafter be fabricated in the Pittsburgh district by the Riter-Conley Company at its Leetsdale plant. This is regarded as a step forward by both parties and will permit considerable saving in freight rates and economy in manufacturing. The sale of Lock-Bar steel pipe will continue to be exclusively in the hands of the East Jersey Pipe Company.

THE AMERICAN CITY

GOODYEAR



Goodyear Cord Truck Tire Goodyear All-Weather Tread Solid Tire



Cross Section of the SC Cushion Tire showing its pressed-on feature and the high dual notched tread

Goodyear (SC) Cushion Fire Truck Tire

Copyright 1922, by The Goodyear Tire & Rubber Co., Inc.

Here is a pressed-on tire that provides, in a superior form, every quality demanded of tires by motorized fire departments.

It is the Goodyear SC Cushion Tire.

Its high, dual, notched tread is designed to carry heavy loads safely, yet swiftly.

It is rugged and strong throughout, without the handicap of superfluous weight.

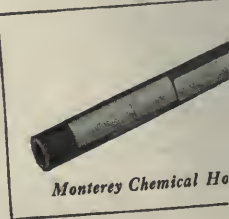
It is built of an improved rubber compound that puts up a surprising resistance to wear, weather and age.

See this exceptionally efficient fire truck tire at the nearest Goodyear branch. Or, if more convenient, write direct to The Goodyear Tire & Rubber Company, Akron, Ohio, or Los Angeles, California.



Single Jacket Underwriters Fire Hose

The Underwriters label on Goodyear Single Jacket Fire Hose and Goodyear Monterey Chemical Hose, means that the latter will resist satisfactorily the biting, corrosive action of chemicals and that both will stand a definite pressure per square inch. Goodyear's years of manufacturing experience has enabled the production of hose on a par with all other Goodyear products—hose which will render dependable and economical service.



Monterey Chemical Hose

When writing to Advertisers please mention THE AMERICAN CITY.



BUCKET DUMPING A LOAD OF MINE-RUN COAL AFTER CARRYING IT OVER 120 FEET FROM CAR

Coal- and Ash-Handling Machinery

The handling of coal from bottom-dump cars to coal storage overhead bins and the rehandling of the same coal in the form of ash are important matters in any power-plant. The Godfrey conveyor, manufactured by the Godfrey Conveyor Company, Elkhart, Ind., is well known to many power-plant engineers. The principle of the Godfrey system is to get coal from bottom-dump cars to a chute underneath the railroad track, the chute conveying it by gravity into a bucket, in which it is elevated and carried to a storage pile or an elevated bin or conveyance. The mechanical units consist of a bucket of approximately 1-ton capacity, a 2-drum reversible hoist, operated by electric or other suitable power, a trolley operating on a monorail or cableway, a steel chute with gates to control the flow of the coal, and the necessary sheaves, cables, etc., for making the connection of the various units. The two types of overhead tracks, namely, the I-beam and the cableway, make the equipment easily adaptable to any one of a large variety of conditions. The principle and operation of both types are the same, while the choice depends entirely upon the local conditions which have to be met.

The entire operation is controlled by one man stationed at the hoist, which is located near the mouth of the track chute. This enables the operator to open and close the gate of the

chute which controls the flow of coal into the bucket. The hoist is mounted on a cast iron base and is of ample proportion to carry the load. The operation of the two drums on the hoist is controlled by clutches, insuring speed and safety with ease of operation. The main or hoisting drum is used to elevate the bucket to the desired height, and the traction drum moves the trolley in either direction on the conveyor track. The trolley supports the hoisting cable on which the bucket sheaves roll. This enables the man at the hoist to lower the bucket at any desired point under the conveyor track without making any changes or adjustments on the equipment.

In the operation of the conveyor, the coal when emptied out of the cars falls by gravity through a specially constructed steel chute into the 1-ton conveying bucket suspended on guide-rails in a pit on the side of the track. When the bucket is filled, the hoist operator closes the gate in the chute, thereby shutting off the flow of coal into the bucket. The hoisting drum is then engaged and raises the bucket to the required height. The operation of the traction drum of the hoist then moves the bucket along the conveyor track to the point where the operator wishes to dump the coal.

The bucket is then lowered until it comes in contact with the coal pile. The contact releases a latch on the bottom of the bucket, which opens it, hereby permitting the coal to flow gently out



INTERIOR OF BOILER ROOM WITH BUCKET UNLOADING AT MOUTH OF SELF-FEEDING HOPPER

MUSHROOM TRAFFIC LIGHT

The Milwaukee Type Mushroom Traffic Light is the most efficient and dependable traffic control unit on the market today. It is made of cast steel and is suitable for installation at street crossings, on heavy traffic streets and boulevards. When illuminated, it is a bright spot on the road without glare. The unit stands only eight inches high, but it is large enough to be noticed and respected. The Milwaukee Type Mushroom Light is accident-proof. Its lighting system is in duplicate, thus insuring constant service.

ELECTRICAL & SPECIALTY SUPPLY COMPANY
Madison Terminal Building Chicago, Illinois



NOW'S THE TIME

To Consider Your Sprayer Needs for This Year



Shade Tree Spraying in Muncie

The selection of the proper sprayer for your parks and shade trees is not a matter of a moment. It requires careful investigation and consideration from all angles.

Many cities went into the matter at great length last year and decided on the BEAN Park Sprayer because of the superfine features insuring economy, efficiency and dependability—3 vital points.

These three features mean long life and really make the BEAN the cheapest sprayer to buy in the long run.

Start the ball rolling now. Get in touch with us and let us figure with you. A card today.

BEAN SPRAY PUMP CO.

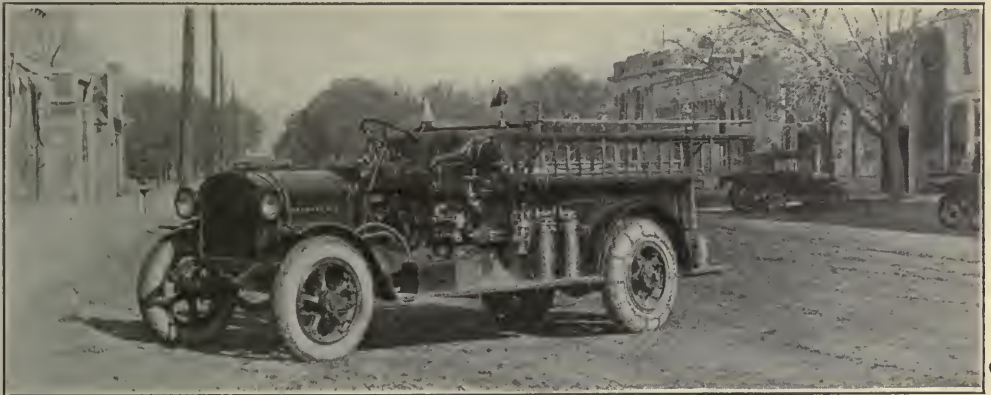
Lansing, Mich.

San Jose, Calif.

without any breakage, and consequently with no degradation. This means of tripping the bucket when in contact with the pile is a patented feature of Godfrey equipment. The bucket can be lowered or hoisted at any point, no stops or trippers being required. The largest lump as well as the finest screenings can be handled. The coal is emptied as the bucket is raised, and the bottom closes automatically. The bucket then travels on the monorail back to the pit for another load. Ashes, sand, crushed rock, gravel and similar materials can be handled in the same way and as cheaply. In many cases the same equipment is used to unload, store and convey coal to the boiler-room and remove ashes to cars or hoppers. Coal can be reclaimed from open storage, or flat-bottom cars unloaded by changing the conveying bucket for a hook-on clam-shell bucket.

A Completely Equipped Motor Pumper

The illustration below, furnished through the courtesy of Dr. I. Lukens, Fire Chief, Tekamah, Nebr., shows a GMC truck equipped by the Northern Fire Apparatus Company, Minneapolis, Minn., for delivery several months ago.



A 2-TON GMC TRUCK EQUIPPED FOR FIRE FIGHTING

The Northern equipment is the standard for a type C 2-ton GMC truck. Among the detailed fixtures furnished with this truck, all nickel-plated, are a drain for the suction base, discharge valves, a 2½-inch hose nipple and cap, a 1¼-inch hand churn by-pass, and a 1½-inch sure release by-pass. There is also included a screen for the suction base and a hard suction set with hose fittings, as follows: 3½-inch 10-foot suction hose, 3½-inch strainer set, 3½ inch adapter holder, with hose hanger set. The cost of this outfit was \$3,260, and the total price, equipped, \$6,000.

The Tractor in Rainier National Park

Moving mountains of snow in order to open Rainier National Park, Washington, for tourists this season, has been the task of W. H. Peters, Superintendent of the Park, who has faced the heaviest snowfall in years and opened the roads at least six weeks earlier than they

would have been opened but for his efforts. More than 160 feet of snow fell on Mount Rainier last winter, according to government records taken from day to day. This precipitation settled into an icy mass averaging 15 feet deep on the level. The only steam shovel available was too wide for the mountain roads, and so TNT was resorted to. Twenty-five tons was used in shots, averaging from 35 to 50 pounds each, spaced about 10 feet apart.

After the snow was blown up, shovelers removed the bulk of it, enough to make a clear space, and then a Reo truck with a Cletrac tractor was sent through to break the way. Ropes and chains were wound around the truck wheels, and with both engines working, the way was negotiated on July 9. The next day the big White truck stages which are used to transport passengers came through on the road with their wheels wound with rope.

One of the principal difficulties, once the road was cleared, was to find parking space for the hundreds of cars that flocked to the park when the road opening was announced. Long alleys were dug in the snow, and the road was gradually widened to make places for them. In the usual parking space around Paradise Inn

there was 10 feet of snow in the middle of July, and the guests were unloaded and taken into the lobby through a tunnel in the huge drift on the mountain side of the building.

The front cover of this issue of THE AMERICAN CITY shows the work of opening the roads in progress.

Kennedy Valve Shifts Representatives

Several changes in the organization of the Kennedy Valve Manufacturing Company, Elmira, N. Y., have been effected recently. H. D. Kane has been appointed assistant to C. A. Burgess as Traveling Representative with headquarters at Elmira; James P. Murphy has been appointed assistant to S. C. Mead, Chicago Branch Manager, and John J. Milliken, who was formerly in the Chicago office, has been appointed assistant to E. H. Koons, Eastern Sales Manager. A new office has been opened in the L. C. Smith Building, Seattle, Wash.

Nation-Wide Move for Memorial Trees

In Honoring Heroes Magnificent Shaded Highways Are Being Constructed

To the Editor of the Public Ledger, Phila. :

SIR—We want to thank the PUBLIC LEDGER very much for the editorial you had the other day, "The Boon of Shade Roads." The day after the signing of the armistice the American Forestry Association began a campaign for memorial tree-planting, and this has spread since to Roads of Remembrance and memorial parks in hundreds of places.

The idea has been taken up on a wide scale in the State of Pennsylvania, and we find that such States as yours that lead in forest developments are all the more keen to take up such plans.

As an example of this, may I cite the Rotary Club of Tampa, Fla., which has planted fifteen miles of the West Coast Highway with memorial trees in honor of the men and women of Hillsborough County who answered their country's call in the World War? At Minneapolis a six-mile memorial drive has just been planted to connect two parks. This is an extremely wide avenue, and has been planted with New England elms that have been in training for three years to take the shape they want them to take fifty years from now. At that time Minneapolis will have one of the sights of the North American Continent.

The various motor highways have been planted with trees in many places. An interesting example of this is at Canton, Ohio, where the Lincoln Memorial Highway Association, an organization of women, has planted several miles of that highway, and this fall is completing a memorial avenue of the Presidents which connects the Lincoln Highway and the tomb of William McKinley, a short distance away. These women now plan to continue the planting of the home of "Mother McKinley," which is on the Lincoln Highway. * * *

Your fine co-operation with us in this educational campaign is valued highly.

CHARLES LATHROP PACK, *President*
American Forestry Association
Washington, D. C.

August 17, 1921.

Wherever you go, and in almost every paper or magazine you pick up you hear or read of "Memorial Trees" being planted for the "boys" who gave their lives in the World War.

And what is more fitting to perpetuate this memory than a noble tree which will not only be a monument to those who have passed away, but will likewise give shade and comfort to the increasing numbers who are now daily using the highways.

Care, however, must be made in the selection of the proper kind of trees for this purpose. A variety that will flourish in one section of the country will not always prove satisfactory in another. Again, soft wooded trees are not long lived. Selections should be made of such varieties that will stand as monuments when our children's children need their shade.

The Pin Oak, the Red Oak and the Sugar Maple are trees which will flourish almost everywhere, and are singularly more free from insect attacks than almost any other tree.

We would be very glad of the opportunity to offer our many years of experience in assisting in the proper selection of trees required for this or any other purpose. Catalogue on application.

THOMAS B. MEEHAN CO.

Wholesale Nurserymen

DRESHER, PENNSYLVANIA

A Device for Transplanting Small Trees

The losses which many park superintendents have had in transplanting small pines and other trees are overcome by a device made by Lionel Weil, Goldsboro, N. C. The device consists of two curved pieces of sheet-iron hinged together on one side and strapped together at the other side. These semi-circular side-walls are preferably of less width at the lower than at the upper bottom, thus providing a receptacle of tapering construction. In order to transplant trees, it is first necessary to dig a circle around the tree, a small fraction less than the size of the top of the receptacle, and, bearing in mind its general outline, dig down until the large roots disappear, the depth not to exceed the depth of the receptacle. The transplanting receptacle is then opened and placed around the column of soil, and the roots are secured by drawing together the straps through the buckles. The bottom is then inserted by projecting two iron pins through holes in front at the bottom of the receptacle. These pins penetrate the column of soil and rest in slots on the same level at the back of the receptacle. The pins form the main support for four slides, which are then inserted through slots in the walls and driven through the column of soil. The slots are placed at intervals of about 90 degrees, and when the slides are inserted a receptacle is formed covering sufficient surface and sufficiently rigid to prevent displacement of the soil or roots. The plant is then ready to be taken up and transplanted.

This operation is quite simple. A hole is dug of sufficient size not only to admit the receptacle, but to provide for the withdrawal of the pins and slides forming the bottom. The receptacle, containing the tree, is placed in the hole, so that the original soil line will be about 1½ inches lower than the new soil line. The pins and slides are then withdrawn. The space immediately surrounding the receptacle should be filled with fine fertile soil up to the first buckle and tamped. Then the buckle is opened. The next fill is up to the second buckle, which is then released, and so on to the last buckle, which is then opened and the walls of the opened receptacle withdrawn. The new soil should be well watered after filling in.



A RECEPTACLE FOR TRANSPLANTING SMALL TREES

mark notice of "Dustoline for Roads" made by the Dustoline for Roads Company, Summit, N. J.

Annual Meeting of Manufacturers of Water Purifying Equipment

At a meeting of the Executive Committee of the Associated Manufacturers of Water Purifying Equipment, held in Pittsburgh, Pa., in January, it was decided to hold the annual meeting at the Bellevue-Stratford Hotel, Philadelphia, Pa., on February 7, 1922. A full attendance is expected, as several matters of importance will be taken up for final determination.

One of the most important of these matters is the adoption of standard specifications for pressure filters for various services, to the end that architects and engineers may have a standard to which all bidders must comply. In the past there have often been as many different size filters for the same required service as there were bidders, confusing the purchaser as to which was the most suitable for his requirement, and often resulting in the purchase of an apparatus entirely inadequate and unsatisfactory to the purchaser and detrimental to the business.

The present officers of the society are M. F. Newman, W. B. Scaife & Sons Company, President; G. F. Hodgkinson, American Water Softener Company, Vice-President; H. G. Tate, of the Borromite Company of America, Secretary.

Hauck Moves Philadelphia Office

The Hauck Manufacturing Company, 126-134 Tenth street, Brooklyn, N. Y., has announced the removal of its Philadelphia office to 1726 Sansome Street. Herbert Vogelsang, who has been connected with the Hauck Manufacturing Company for six years in the sale of portable oil burners, torches, furnaces, etc., will be in charge.

Error in January Issue

On page 65 of the January, 1922, issue of THE AMERICAN CITY, there appeared a typographical error in the omission of the trade-

VERTICO-SLANT Drinking Fountains



Are Sanitary and—

thoroughly satisfactory and convenient from every standpoint. The slight angle of the Vertico-Slant fountain obviates the necessity of the special valve for drawing water to fill the glass or cup, as an individual drinking cup may be readily filled as from a faucet. Finger contamination is practically eliminated, as the nozzle as located at the bottom of a recess protected by a wall on either side discourages the attempt.

Lips Cannot Touch the Nozzle

Full descriptive literature and a copy of our new bubbling fountain catalog will be sent to any city officials or industrial plants free upon request.

Rundle Spence Mfg. Co.
MILWAUKEE, WIS.



No matter WHAT drinking fountain you may put
INDOORS

← This
The MURDOCK
PATENTED

↔ **ANTI-FREEZING** ↔
BUBBLE-FONT

IS THE ONLY ONE THAT IS SAFE
TO INSTAL OUTDOORS BECAUSE

it is the only drinking fountain made that was designed and is built solely for outdoor use. It does not have to be turned off at the approach of cold weather.

THE ONLY FOUNTAIN MADE THAT IS STRONG ENOUGH TO WITHSTAND PUBLIC ABUSE.

Write for fully illustrated literature to
The MURDOCK MFG. & SUPPLY CO.

**FIRE HYDRANTS
YARD HYDRANTS
HOSE BOXES**

CINCINNATI, - - - - - OHIO
Builders of Water Service devices since 1853



THE CALIFORNIA BENCHES

Patented 1913-1914-1916-1917-1921-and pending

These benches are a high class finished product, the above being one of seven refined designs originated by us. The seat and back are of two by four clear wood properly finished and fastened through the concrete ends with wooden wedge pins.

In order that Park Boards and individuals may now obtain this fine product at commercial prices everywhere, we have arranged that local concrete products manufacturers in various districts of the country may obtain the Patent Rights and the perfected iron molding machines for same at reasonable cost.

Hundreds of these benches are in use by the Cities, Parks, Resorts and Universities, famous upon the Pacific Coast, and their utmost utility, permanence, and attractiveness appeals to all.

Your valued inquiry might include name of a local firm, or we will endeavor to establish its manufacture through your Chamber of Commerce or advise you nearest factory.

ART CONCRETE WORKS

Originators and manufacturers for 35 years.
340-364 So. Fair Oaks Ave., Pasadena, Cal.

TRAFFIC CENSUS										
Taken from 12 01 A.M. Saturday April 30 th to 12 00 Midnight Monday May 2 nd 1921										
Sta No	TL No	Location of Station	Sat April 30 th		Sunday May 1 st		Monday May 2 nd		Total	
			Pleasure	Commercial	Pleasure	Commercial	Pleasure	Commercial	Pleasure	Commercial
1	3	On Southbury side about 1000 feet from Farnsworth Bridge							998	115
2	2d	At junction of Newtown and New Milford Road in Danbury							1881	291
3	2	At junction of New Milford and Newtown Road in Danbury							1739	278
4	2b	At east end of Lough Contract Mill Plain Cut-off in Danbury							1968	344
5	13-14	300 feet beyond Boardman's Bridge School-House							189	26
6	14	Three-quarters of a mile outside of New Milford Village							1377	186
7	13	One half mile outside of New Milford Village							434	89
8	2e-4	Derby-Elizabeth Street	6173	1084	4674	192	3531	1169	14,378	2445
9	2e	Derby Avenue near City Line	3004	709	2983	301	2080	598	8067	1608
10	4a	Woodbridge-Seymour Stage Road at New Haven City Line	511	102	702	94	458	119	1671	315
11	6	Hartford Road-Grand and Quimpiac Avenues	2846	1074	4265	416	2894	1224	10,005	2714

TABULATION OF TRAFFIC CENSUS IN CONNECTICUT

Traffic Studies on Our Roadways

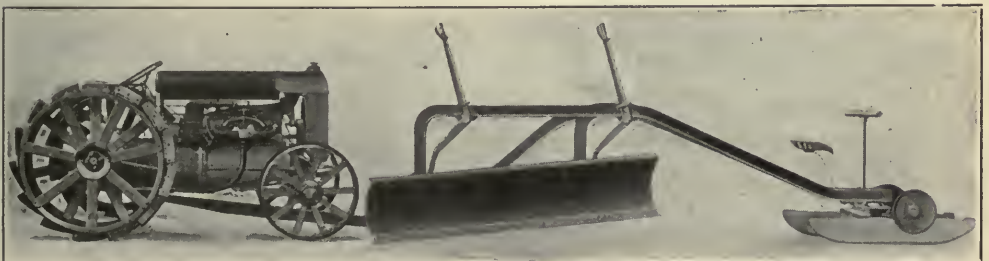
The versatility of counting-machines has long been recognized by business men generally. In fact, their application is so universal and the results secured by their use so reliable that their value is never questioned. There are many officials, however, who have never thought of the hand tally as the means to the solution of the problem facing street and highway departments in counting traffic when trying to reduce the great expense of maintaining roads. The State Highway Department of Connecticut has made a most extensive study of the roads in different parts of the state in order to determine the maintenance costs under different types of traffic at different points throughout the state. The Highway Commissioner determined upon the plan of taking the highway traffic census at different points for a three-day period. Accordingly, one hundred hand tallies were secured from the Root Company, Bristol, Conn., manufacturers of various types of counting-machines, and operators were stationed at the different points.

The results of this investigation were then carefully tabulated according to whether the traffic was of a pleasure or a commercial nature. By referring to the table partially reproduced herewith, it is seen that an accurate record is now available which will furnish the

sought-for means of keeping the appropriate balance between the cost of maintenance and the character of the traffic. It will serve as a check on the character of work done by those who have constructed the various roads in the past, and will furnish a means of determining those road builders who have succeeded in building roads that stand up under the service test.

A Blade Type Snow-Plow

The snow-plow illustrated herewith is a new development of the blade type snow-plow which has been brought out by the Wehr Company, 549 30th Street, Milwaukee, Wis. This snow-plow has a 10-foot blade set at an angle of 45 degrees, cutting an 8-foot swathe. The blade can be raised or lowered at either end. The runners, which carry the entire weight of the plow, are 4 feet in length and can be raised clear of the road so that the wheels carry the plow over bare places. When the blade is raised from the ground, it clears the surface by 18 inches. The entire weight of the plow is 2,000 pounds, including an additional drift wing. The draft of the plow is carried to the end of the push-bar connected to the center of the tractor for pushing the plow, so that side draft is evenly distributed to all four wheels of the tractor, and thereby practically eliminated. With this equipment it is possible to handle 12 inches of snow at a speed of 8 to 10 miles per hour.



A TRACTOR-DRIVEN BLADE SNOW-PLOW FOR ROAD WORK

THE AMERICAN CITY

Speed City Haulage Jobs

With Wood-Detroit Equipment

Wood-Detroit hoists and bodies are used by cities from coast to coast, handling garbage, cinders, asphalt, coal, sand, and similar loads; for we have developed special equipment for each need.

Write for special municipal equipment folder; it gives the new prices and tells you how to cut costs.

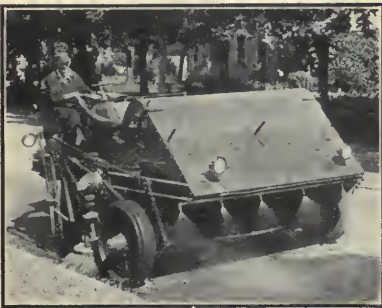


Wood Hydraulic Hoist & Body Co.

4196 Bellevue Ave. Detroit

Special body for handling garbage—waterproof, clean-dumping.

The ELGIN Line of Motor Driven Machinery for Cleaning Streets



The ELGIN with gutter attachment

THE ELGIN—Sprays the street, cleans the gutter, sweeps ten feet of pavement, picks up the refuse and carts it away. Operated by one man. Known for its willingness to clean streets at the lowest cost. Ask for Circular A-48.

THE AUTOSWEEPER—Sprays the pavement and sweeps a seven foot path, leaving it in a clean condition. Operated by one man. Excellent for direct displacement of horse-drawn sweepers and for use as a "feeder" to pick-up machines. Ask for Circular A-44

THE AUTO-EDUCTOR—Cleans catch basins at half the cost of antiquated and unhealthful methods. Also is a flusher for street cleaning. May be equipped with sprinkling heads for sprinkling work, etc. Ask for Circular A-50.

ELGIN SALES CORPORATION

501 Fifth Avenue
NEW YORK

U. S. A.

Old Colony Building
CHICAGO

Motor-Cycles for Police Use

The organization of the Massachusetts State Police Patrol has been of great assistance in protecting farmers, inhabitants of remote villages, country storekeepers and others from prowling criminals. This body of state troopers was formed as a part of the great machine to help make the beautiful roads and highways of the state safe from reckless and careless motorists and to exercise a degree of supervision over such drivers, as the city and town police do within the limits of their municipalities.

The force is patterned in many respects after the Pennsylvania and New York constabularies with here and there a suggestion of the Royal Northwest practices. Its members are known as patrolmen, and its officers are sergeants, lieutenants and captains.

The man who has been mainly responsible for the creation of this force is Colonel Alfred F. Foote. The force consists of 50 men, and the appropriation for the organization amounted to \$47,000. The general headquarters are located at what was formerly the state poor farm at Framingham, Mass.

The question of transportation for the members of the force was of great importance. After a period of experimentation, 20 middleweight Indian scouts were ordered from the Hendee Manufacturing Company, Springfield, Mass., and this original order has been doubled, so that there are now 40 of these cycles in use. It has been found that a patrolman on a motor-cycle can cover a beat of approximately 100 miles in each working day without any hardships. Horses are used when the winter snows block the road for the motor-cycles. Probably not more than a few days a year will see the activities of the force curtailed in this manner. It is expected of the men of the force, that they learn to handle their motor-cycles as well as any of the crack drivers of the motor-cycle sport.

Manufacturer Inaugurates Five-Day Week

Announcement has been made by M. E. Gray, President, Rochester Can Company, Rochester, N. Y., that, beginning January 5, 1922, the plant has been working 8 $\frac{3}{4}$ hours each day, closing down on Friday night for the week, allowing the men all day Saturday for recreation and enjoyment. In this way the men work the same number of hours and draw the same amount of pay, with the additional advantage of having the full day Saturday to themselves.



A SERGEANT OF THE MASSACHUSETTS STATE POLICE ASTRIDE HIS "STEED"

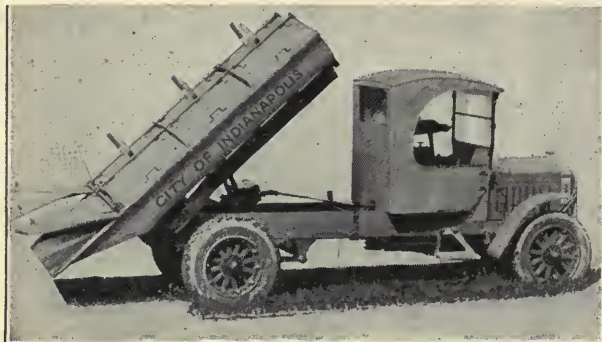
The Rochester Can Company believes that it has been the originator of the "All Day Saturday Off" idea, at least in Rochester. The factory has just completed the busiest year in its history and started in 1922 with even a greater volume.

Wallace & Tiernan Personnel

Wallace & Tiernan Company, Inc., Newark, N. J., has recently opened two new offices and made several changes in its personnel and additions to the staff. An office has been opened at 1046 McKnight Building, Minneapolis, Minn., in charge of B. M. Conaty, formerly of the Chicago office. The new office will cover the states of Minnesota, North Dakota, South Dakota and Montana, and the Canadian provinces of Alberta, Saskatchewan and Manitoba. E. M. Lawson, formerly of the San Francisco office, has been transferred to the Kansas City office, 707 Commerce Building, Kansas City, Mo. This district covers the states of Missouri, Kansas, Nebraska, Colorado and Wyoming. R. B. Mowry has recently been appointed representative for New Jersey, Delaware, Maryland (Eastern Section), District of Columbia, and Virginia, with his headquarters at the home office.

Wallace & Tiernan, Ltd., was recently organized, with headquarters at 73 Adelaide Street, East Toronto, Ontario, Canada, J. Van Benschoten, Manager.

Several additions have recently been made to the technical staff, including S. H. Gregg and G. I. Nelson, who will be attached to the personnel of the Chicago office; W. Van Benschoten is now temporarily attached to the Chicago office; A. LoPrest to the San Francisco office, and R. M. Finch to the home office. At the home office sanitary and industrial sales will be handled separately. L. H. Goebel becomes Manager of Industrial Sales, and R. V. Donnelly, Manager of Sanitary Sales.



The Collection of Garbage

in municipalities is a problem that we can help you solve. Heil's Steel Bodies and Hoists are properly designed for this kind of work. Notice the tapered end of this garbage body, the steel covers, the "under the body" Hoist which makes for easy loading.

Tell us your requirements and we will send you complete literature on Garbage Bodies or other types of Dumping Equipment.

THE HEIL CO.

1242-60-26th Ave. Milwaukee, Wis.

Distributors in principal cities

Repair Your Streets with THE LUTZ SURFACE HEATER

It softens asphalt and other bituminous pavements. It vulcanizes the old and new material into a perfect bond. It cements Asphalt on Granite, Brick, Cobble, or other hard pavements. It makes re-surfacing and maintenance easy and inexpensive

Illustrated Particulars on Request

Equitable Asphalt Maintenance Co.
1901 Campbell St. Kansas City, Mo.



Repairing an Asphalt Pavement, New York

Bound Volumes of THE AMERICAN CITY

A set of bound volumes of THE AMERICAN CITY makes a most valuable reference work for municipal offices, public libraries, etc., and we are in a position to supply all volumes from Volume I to Volume XXIV, inclusive. The prices of the volumes vary somewhat on account of the scarcity of some of the issues contained. We will be glad to quote terms on application.

THE AMERICAN CITY, 154 Nassau St., New York City



Road building is a wasteful process without the

BURCH STONE SPREADER

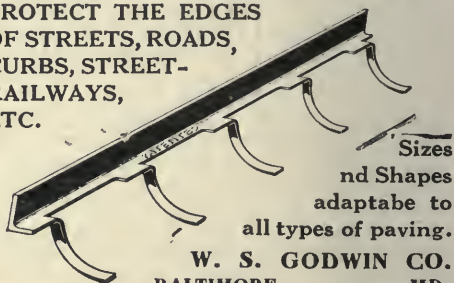
Hitched to the back of a truck, it automatically spreads stone to the required width and depth, doing a quicker and better job than men can do.

The saving in men and labor is great. This spreader often pays for itself in a mile of construction. Let us send you proofs and description.

THE BURCH PLOW WORKS CO.
101 Bucyrus St., Crestline, Ohio

STEEL PAVING GUARDS

PROTECT THE EDGES OF STREETS, ROADS, CURBS, STREET-RAILWAYS, ETC.



W. S. GODWIN CO.
BALTIMORE, MD.

CONNERY'S

Non-Leakable Welded — "Held by the Weld"

20 STYLES 10 TO 1000 GALLON CAPACITY

Constructed for Service and economy. Our most complete stock enables you to obtain any size and style of Heater you require.

Kettles for class of fuels.

Construction and repair work require them.

We stock them.

Our stock—Your Service.

Write for Catalog and prices.

CONNERY & CO., Inc.
4000 North Second St., Philadelphia, Pa.

Volume
XXVI
Number 3

The American City Magazine

New York
March
1922

A New Aid in City Planning

By Nelson P. Lewis
Consulting City Planning Engineer

IN all city planning work a knowledge of the topography is one of the first essentials. Where the surface is at all irregular, a quite accurate topographic survey is necessary before the plan can be worked out in detail, and it is obvious that such a survey of the entire area would be of much

value in the preliminary study. A topographic survey, as generally understood, would, however, involve large expense, while great accuracy is unnecessary during the earlier stages of city planning.

It might be well also to emphasize the fact that in planning new territory it is a



PORTRAYING THE COMPARATIVE DEVELOPMENT ON TWO SIDES OF A RIVER

In the above view, note the many industrial plants on one side of a navigable waterway and their entire absence on the other. The explanation is found in the fact that one side has trunk line railway connections, while the other has none. It is quite obvious what is needed to make available for industries the water-front property now unused

mistake to make the first plans in great detail. The essential thing is the general character of the plan, which should be worked out in a logical manner, and if that be done with the existing topographical conditions as a basis, the plan cannot well be spoiled in the subsequent elaboration of detail. But instrumental field surveys, even to obtain such data as may be necessary to lay down tentatively the general structure of the plan, not only require much time and expense, but involve some work which must be done over again when the complete topographic survey is made.

A Quick, Comprehensive Survey

The development of aerial photography has made it possible to secure information of very great value at relatively small expense; such information as will make it possible to decide both quickly and intelligently upon some general features of the plan which can be developed most economically and with best adaptation to topography. One can ride, or even walk, over the territory for which a plan is desired; he may follow the valleys, climb over the ridges, observe the location of buildings and of wooded tracts available for public playgrounds and other essential features, but will retain only a confused idea of their position with respect to each other. Suppose, however, he were able to look down upon this same territory from a height of one or two miles and to carry with him a permanent and accurate record of what he saw, how greatly it would help him to decide upon the general scheme, the details of which may be developed later.

He could not, of course, get an accurate impression as to relative elevations. A very good idea of surface irregularities, however, can be secured from the contour maps of the Geological Survey and from occasional oblique views taken from the same or a lower elevation than that from which were secured the vertical views which when put together as a mosaic make the sort of map which the writer has in mind. A small cluster of houses, or other buildings, is noted on one part of the map, a larger group in another, while an almost continuous line of buildings traverses it in a certain direction. A careful examination of the picture will show the reason. You can trace a railroad running up a valley, along which are scat-

tered these different groups of buildings; you will see an improved road along which there is a series of homes and outbuildings; the sparkle of running water shows an intersecting valley; lakes or ponds can be discovered either in the open or surrounded by what appears to be a luxuriant forest growth.

Obviously, the opportunities for taking advantage of existing conditions in developing a plan for the territory are greatly increased. In following a navigable waterway, one side is found to be quite intensively used as sites for industrial plants; the other is almost entirely undeveloped. What is the reason for this? A close examination of the picture will probably show that there are railroads running down to one side of the waterway and there, where rail and water meet, are the industrial plants. The other side of the stream has just as good facilities for water transportation, but no railroads. This fact will give a valuable hint to one studying the situation, as to what is needed to insure better use of natural facilities for transportation and to promote industrial development.

It is not only in the mapping of undeveloped territory or of new additions to existing towns that this new art is of very great assistance. Much of the work of city planning is devoted to the correction of mistakes or supplying omissions in the plans of territory already intensively developed. We may be well aware of the defects of the present plan, may realize the need of additional thoroughfares to relieve existing congestion, may appreciate the need of better connections between the different units of our park system, may feel that our waterfront should be utilized to better advantage; but riding or walking about the town or the careful study of maps will not give us such a vivid impression of the existing conditions or help us to arrive at a possible solution, as will the opportunity to look down upon the city from an elevation sufficient to give a distinct view of the area as a whole, but low enough to enable us to see every important detail.

Traffic Conditions Clearly Seen

There are the long lines of vehicles collecting alternately on two important streets at their intersection, while at another point a gyratory movement of traffic permits all



The photograph and line map above illustrate the advantage of an aerial photographic survey in the development of a city plan. The features of the photograph to be retained were inked in on the original; the photograph was then bleached, the inked lines only remaining. A study of both photograph and line map will be of great assistance to the city planner in determining the portions of the existing layout which should be retained, the connections and additions necessary to make a rational plan, and the topographical features which should be emphasized

to keep going. There are great numbers of trucks which should be moving, but which are standing at certain piers and railroad terminals, indicating that some improvement of both rail and water terminal facilities is greatly needed. There are parks, within which we can plainly see what must be attractive drives, but even at this vantage point we can see no connections between them except by narrow streets, already crowded by miscellaneous traffic, so that those trying to go from one park to another must choose between streets none of which have the character of parkways or give the slightest evidence that they are connections between different integral parts of a park system.

There are fragments of wide streets along the water-front, which if connected with each other would provide a wonderfully interesting thoroughfare and afford relief to the congested streets further inland, and the picture plan made from above indicates where and how such connections can be made most easily and least expensively. Public buildings can readily be located and the adequacy or inadequacy of their sites as to extent and the suitability of their locations will be appreciated, and if mistakes have been made they can be avoided in the future planning of streets or new municipal buildings.

For Constructive Work in Peace-Time

We know that aerial surveys and mapping were of the greatest possible use during the World War in locating points within the enemies' lines which were vulnerable to attack, but we have found that this same method of aerial photographic surveying will disclose the logical points of attack for those who are bent, not upon destructive, but upon important constructive work, upon the better utilization of natural conditions for commerce, for homes or for wholesome recreation. A relief map in the study of any territory looking to its best development would be of the greatest value, but that could be made only after the collection of accurate information and as the result of field surveys.

If then, without equipping survey parties and spending weeks and months laboriously collecting information which is later to be used in preparing maps and making relief models, we can, in as many days as the other survey would require months, obtain accurate information as to existing conditions, it is quite evident that a great advance has been made in a direction which will be of inestimable value to those planning for the future development, not only of cities, but of suburban and rural districts.

Acknowledgment: Photographs by courtesy of Fairchild Aerial Camera Corporation, New York City.

Association of Merchants Installs Street Lighting System

By A. E. Suker
Lighting Specialist

A NEW lighting system has been installed in Short Street, Lexington, Ky., as the result of the energetic work of the business men who have establishments along that thoroughfare, and instead of the six lamps which formerly illuminated it, it now has twenty-six. Short Street, which is in the business section of Lexington, is appropriately named. It is only six blocks long, extending parallel to the main street of the city and distant one block from it. It is a street of numerous small stores, the proprietors of which felt that in order to compete successfully with

those on Main Street the thoroughfare would have to be improved.

The Short Street Improvement Association was therefore organized and the work of improvement was begun. It was agreed, however, that an adequate lighting system was essential to any such program. The suggestion had been made some time before that this was needed, but it was felt that it could not be carried out for some time to come. Nevertheless, the Association began to work for the project.

The matter was taken up with the Utilities Company, which first estimated the cost at

\$25,000. Later, when material became cheaper, this was reduced to \$21,000. Bonds for meeting the cost were issued, and the Association, aided by the Lions Club, began the task of selling them, the Lions Club disposing of \$12,600 worth. According to Maurice Loevenhart, President of the Association, the entire block of bonds was bought by fewer than 45 persons who own property or are in business on Short Street.

The Association chose a Form 6 General Electric lighting unit equipped with diffusing globe and a 1,000-candle-power lamp operated from a transformer placed on a cross-arm near the top of the pole. Where tubular steel poles are used, the secondary wires of the fixture are run inside the pole through a cap over the top, and where the unit is installed on a wooden pole, the secondary wires are run in wooden moulding down the side of the pole, and the wires enter the acorn-shaped ornament at the bottom of the gooseneck near the pole plate.

Twenty-six of these units were purchased and mounted on bishop's crook brackets attached to tubular steel poles manufactured by the Electric Railway Equipment Company. These poles are placed, staggered, at intervals of 100 feet, and the lamps are mounted at a height of 17 feet from the street to the light source.

When the new system was completed and ready for operation, Short Street reintroduced itself to the people of Lexington with a program in honor of the occasion.

The Lexington *Herald* of December 4 says of it:

"The culmination of several months of progressive effort on the part of the business men along Short Street came at 7:30 o'clock Saturday night, when the new 'White Way' blazed forth along that thoroughfare amid all the noise and bustle of a crowd of several hundred, which had gathered for the celebration that attended the event.

"Twenty-six powerful electric lights suddenly took the place of the six that have served to illuminate this section for many years, and Short Street immediately jumped into greater popularity with the people of Lexington.

"The old lights were discontinued at 7:20 o'clock in order to make the appearance of the new 'White Way' even more effective, and the street was in darkness for ten minutes, except for the glare of the headlights of the scores of automobiles that crowded the ways for the occasion. A great crowd gathered along the length of the street from Limestone to Broadway to await the inauguration of the most forward step taken by Short Street business houses



TYPE OF NEW STREET LIGHTS IN BUSINESS SECTION, LEXINGTON, KY.

in years. After the lights had been turned on, the crowd gathered on the plaza at the courthouse and listened to a number of selections by Storm's band, which had been engaged especially for the event."

City and Street Railway Company Cooperate in Paving

Economy Made Necessary by War Conditions Produces Attractive Parkway
Space for Street Railway Tracks

SALT LAKE CITY, UTAH, has recently adopted an innovation in street railway track improvement in conjunction with the local street railway company. When the paving improvement was undertaken on 7th East Street, between 5th and 13th South Streets, the question of the improvement to be made over the traction company's double-track right of way was considered. Under a municipal statute the street rail-

finally worked out, providing a center parking space 26 feet wide, in which the street railway double tracks should be laid, with a paved roadway on either side 24 feet in width. For the lower portion of 7th East Street, the double tracks were moved over to the west side of the street along the park, partly on the street and partly on park property, this leaving a 36-foot clear roadway free of tracks.



VIEW ALONG 7TH EAST STREET, SHOWING NEW PARK AREA FORMED BY MOVING STREET RAILWAY TRACKS

way company is required to pave its right of way, including two feet outside of the outer rails. Because of the company's financial status, due to war conditions, it was very anxious to save the expense of paving its entire right of way. In addition, property owners were desirous of having center parking on the street in so far as circumstances would permit.

The upper portion of this street, between 5th and 9th South Streets, is 132 feet wide, whereas the lower portion between 9th and 13th South Streets along Liberty Park is only 66 feet wide. After a careful study of the matter, a plan of the upper portion was

As a consideration, the traction company paid a material portion of the cost of paving, which was much less, however, than would have been the cost of paving the entire right of way. Since the work was completed, the traction company has planted lawn grass on these parkings, which is growing very nicely.

The consideration shown the traction company by the municipal officials is commendatory, for in these times when many traction companies are operating under unusual burdens, strict adherence to municipal statutes and franchises may cause the loss of the service of the utility to the city.

Open-Channel Drainage for Malaria Control

By Fernald E. Hulse

Sanitary Engineer, International Health Board

ONE of the most practical means for the physical control of malaria is the prevention of the breeding of the *Anopheles* mosquito. This has been done with considerable success for some time by different methods, such as the use of oil, larvicides, subsoil tile drainage, and open ditches. It is the last-named form of physical control which will be discussed in this paper.

Theoretically, drainage for the control of mosquito breeding resolves itself into math-

engineer is ready to map out the drainage system, deciding on the number, size, type, and grade of the ditches and channels to insure a rapid run-off. The size of the ditches and rechanneling of existing water-courses can be determined mathematically, but it is reserved for the engineer's personal observations to determine the type of ditch which will be most effective and have the longest life with the minimum cost of construction and maintenance.

Mosquitoes breed in great abundance in



GOOD EXAMPLE OF "V" TYPE DITCH WITH SLOPE SLIGHTLY STEEPER THAN 45 DEGREES

ematical calculations and is carried out on strictly engineering principles. When an area for control has been specified, an accurate topographical map should be made, noting all possible and probable breeding-places, the nature of the soil, the kind of vegetation and the rapidity of its growth, and any other features relative to drainage. Sufficient rainfall data should be collected in order that the average run-off may be calculated, and thus the amount of water that must be drained in a given time determined. When this has been done, the

low, flat-lying areas where water is likely to stand for days and weeks at a time. The most serious drainage problems relative to malaria control will therefore be found in countries where differences in the elevation of the terrain are very slight. For example, in the Southern States along the Mississippi River the land as a rule is low and flat and in most cases below the level of the river, being protected by levees. These delta lands have a relatively high water-table, and the seepage is slow. They are therefore likely to be difficult to drain,

Another example of similar conditions is the marsh-lands along the New Jersey coast, where also differences in elevation are very slight and the water-table high, because of changes of the tide. Under difficult drainage conditions of this kind, control usually resolves itself into ditching and the use of tide-gates for the purpose of concentrating the water, with no actual attempt to secure a complete run-off.

In the delta region at Mound, La., the writer observed that the average grade of the natural watercourses or bayous was one foot to a mile; consequently drainage by ditching, if attempted, would necessarily be a precise engineering problem. Moreover, conditions in Louisiana are more or less similar to those in the tropics, for there are distinct wet and dry seasons. Ditches must therefore be so constructed as to produce a rapid run-off during the heavy and extended rains. Another example of slightly differ-

ent conditions is found in the Department of Rivas in Nicaragua close to the shore of Lake Nicaragua. This territory is exceedingly malarious. The soil has a fairly rapid run-off and a fair rate of absorption, but has poor natural drainage because of the topography and the dense vegetation.

The facts governing ditching for malaria control may be presented in tabular form:

- I. Country
 - Temperate
 - Semi-tropical
 - Tropical
- II. Rainfall
 - Maximum precipitation yearly
 - Maximum precipitation monthly
 - Maximum precipitation in twenty-four hours
- III. Nature of Terrain
 - Elevation above sea-level
 - Porosity of soil
 - Vegetation
- IV. Limitation of Funds Available

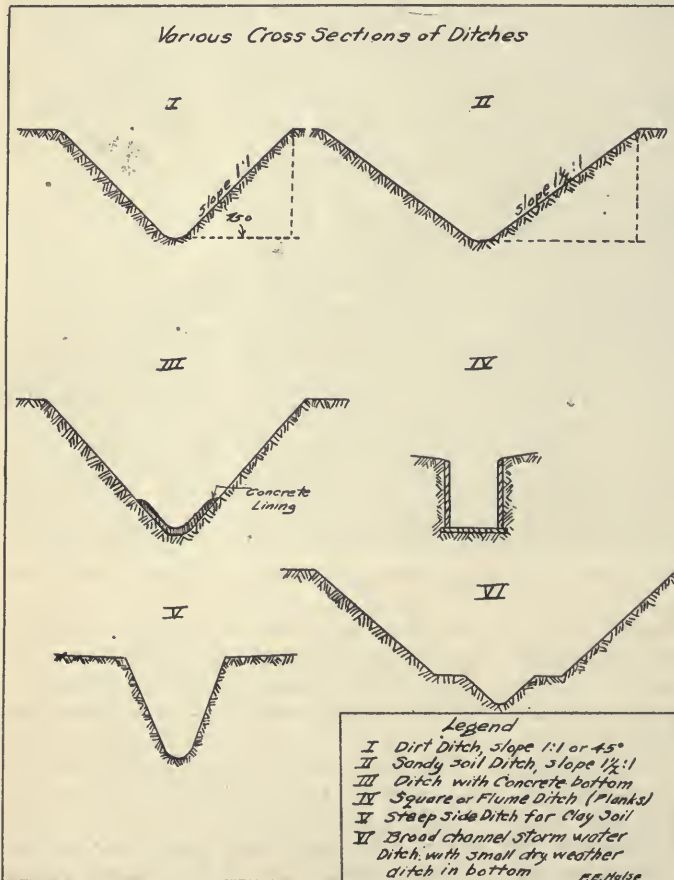
The following are the types of ditches that may be employed:

- I. Concrete Ditches
 - Half-round
 - "V" ditch

- II. Flume or square ditch
- III. Open Dirt Channel
 - "V" type ditch
 - Broad channel with small "V" type in the bottom for varied flow
 - Combination of the two above
 - Straight side ditches for clay soil and sandstone
- IV. Other Forms
 - Brick
 - Stone
 - Wooden

The following are the types of ditches for various conditions in the order of their length of life:

- I. Low, flat land with high water-table and relatively poor soil absorption
 - a. Concrete "V" type or half-round type. Ex. Canal Zone Panama, Le Prince
 - b. "V" type, dirt sides, slope 45°
- II. Same as I, but in a sandy soil
 - a. Concrete "V" type or half-round type with wing-walls and weep-holes. Ex. Le Prince, Canal Zone, Panama
 - b. "V" type natural open-channel slope, 1½ or 2 on 1
- III. Country with slight difference in elevation, but heavy precipitation, soil porous or wet
 - a. Broad channel with small "V" type or half-round type in bottom, of concrete
 - b. Same as a, but of dirt



- IV. Country with good fall, soil sandy, heavy rains (Tropics)
 - a. Broad channels, frequent wing-walls to prevent wash, and "V" type channel in bottom of broad channel
- V. Same as IV, with firm soil and average rainfall
 - a. Open-channel ditch of concrete or dirt of strictly "V" type, slope 45°
- VI. Flat country, firm soil, clay or "gumbo," with average rainfall (Louisiana)
 - a. Concrete "V" or half-round types
 - b. Small "V" type ditch with slope 45°
 - c. Open channel flume or square type

A few of the points to watch in the construction of ditches or in rechanneling natural stream courses are these:

1. Have ditch as straight as possible; the fewer bends the better.
2. Bends should not be at right angles, but over 130° to prevent undercutting of banks.
3. Where bends must be more abrupt, use baffle-boards or widen the channel to reduce the current.
4. Avoid too sudden a change in grade, to prevent gouging of the channel bottom.
5. In sandy soil and on steep slopes use wing-walls to prevent side wash of sand into the ditch.
6. Passing through culverts and under bridges, widen the channel at the approach, to reduce the velocity of the current.
7. Laterals should not enter the main ditch at right angles to main ditch, but on a large bend or an acute angle pointing in the direction of flow. In case a lateral enters the main ditch above the grade of the main ditch, a stone fill is necessary in the channel of the main ditch to prevent scouring at the point of discharge. This stone fill is necessary in some cases in the channel of the ditch at the point of a sudden drop in grade, to prevent scouring. Also a stone ramp or fill is necessary at the down-stream end of culverts and small bridges where the channel is narrowed, thus increasing the velocity and possibly causing a scouring of the channel.

Hints on Ditch Construction

To increase the velocity of a stream.—

There are numerous means by which the velocity of a stream may be increased: for example, make the ditch narrower at the

point where the increased velocity is desired, either in the original construction or by a plank wall on either side of the channel and filled behind; increase the grade or slope of the channel; or make the sides of the ditch more nearly perpendicular. The last-named method can only be employed where the nature of the soil will permit.

To decrease the velocity of a stream.—

This may be done by reducing the grade of the channel or by widening the ditch at the desired point, and in some instances by the use of baffles in the stream channel itself. Unless this latter method is applied with caution and only after some study, scouring and undercutting of the banks may result.

Maintenance of permanent grade.—In open dirt ditches a very good method of retaining the original grade is to drive stout flat-topped stakes into the bottom of the channel at intervals of ten or twelve feet, the tops of the stakes to be level with the bottom of the channel. In case the ditch fills with sand, it is a comparatively simple process to dig down to one of these stakes and thus find the grade, then follow along to the next stake, and so on. Where open ditches are necessary on account of limited funds, this method will effect considerable saving in the cost of maintenance.

Some methods of filling.—The use of stone with gravel firmly packed and then cemented with a thin coat of neat cement is an ideal method. Where cement is not available, clay may be used effectively to fill the voids of the cracked stone. In Nicaragua, where the soil is loose and shifting, the writer found that driving a large number of stakes to grade into the bed of the stream and then filling with cracked stone, the whole covered with earth and packed down firmly, resulted in a very good fill.

Lignite Replaces High-Grade Coal in Municipal Power-Plant

Use of Low-Grade Fuel Made Possible by Mechanical Stokers

ADJACENT to the power-plant of the water and light plant, Moorhead, Minn., are beds of lignite and other low-grade coals. In spite of the proximity of these fuels, the plant was burning Pochontas mine-run under its 200-horse-power Stirling boiler because no effective

means of making use of the low-grade fuel had been found by the management, without endangering the plant's ability to give uninterrupted service such as a power-station of this type must give.

After considerable investigation it was decided that these fuels could be efficiently

burned on underfeed stokers. This led to the installation of two Jones "Standard" stokers which are similar to types which have been used elsewhere for burning high-ash, low-volatile coals with relatively high efficiency, high capacities and continuous operation. The stokers were immediately started, using Wilton, North Dakota, lignite, a coal with a B.T.U. of only 6596 as fired. A series of three tests was made to determine the efficiency of the stoker and boiler at regular loads, heavy loads, and capacity. The results are shown below in tabular form. The tests determined that

there was an efficiency of 65.9 at regular load, and 64.5 at heavy overload. In the capacity test 296.7 boiler horse-power was developed in the 200-horse-power boilers, giving 148.4 per cent of rated capacity.

After this combination had been in operation for over two years, tests showed that the plant gave 20 per cent maximum capacity over the boiler rating with 65 to 70 per cent efficiency, the draft pressure being $\frac{3}{4}$ -inch water. The installation of the stoker had cut the cost of fuel \$1 per ton, equal to 40 per cent in cost, through the use of a lower grade.

RESULTS OF BOILER TEST

Coal Burned: Wilton, Dakota, Lignite

	At Regular Load	Under Heavy Load	Capacity Test
Coal burned per hour as fired.....lbs.	1061	1734	2533
Coal burned per hour per retort.....lbs.	531	867	1267
Water evaporated from and at 212° per hour.....lbs.	5246	8007	10237
Water evaporated from and at 212° per sq. ft. of heating surface per hour.....lbs.	.....	.....	.....
Boiler h.p. developed (average).....b.h.p.	152.1	232.1	296.7
Per cent of rated capacity developed.....per cent	76.1	116.1	148.4
Water evaporated actual per pound coal as fired.....lbs.	4.59	4.27	3.71
Water evaporated from and at 212° F. per pound of coal as fired.....lbs.	4.94	4.62	4.05
Water evaporated from and at 212° F. per pound of coal dry.....lbs.	7.37	6.88	6.03
Water evaporated from and at 212° F. per pound of coal combustible.....lbs.	8.22	7.67	6.72
Efficiency of boiler, furnace and grate.....per cent	68.9	64.5	56.5

A Discussion of Stokers

TO THE EDITOR OF THE AMERICAN CITY:

I want to ask for a limited space in THE AMERICAN CITY for a review of the article, "Hand Versus Mechanical Handling of Coal and Ashes," by W. F. Schaphorst, M. E., in October, 1921, and continued in the November number. I have been familiar with the various types and forms of stokers in use for forty years.

The author's contribution to the subjects treated is not without merit. There are, however, some quite confidently made assertions which are misleading. For instance, stipulation No. 2, page 324, of advantages of stoker over hand fire, says in part: "It is independent of the physical ability of the mental attitude of the fireman or his assistants." This sounds like a copy from a stoker-promotion circular. There are at least five distinctly different types of stokers, and three or more different makes of each type, with the operation of which I am quite familiar. I have never yet seen or known a stoker that is independent of intelligent supervision to secure good results, even in a single-boiler plant, much

less in a 5,000- or 7,000-h.p. plant. Moreover, on page 327, in the fourth of his stipulations of disadvantages, the author flatly contradicts himself as follows: "The mechanical stoker requires human attention." I should say, intelligent supervision.

No person should be deceived in reference to necessary attendance even with use of the best form of automatic boiler furnace, nor should any believe that best hand firing on tests can equal best operation of best completely automatic furnace, much less in regular daily or average work.

There is "no such animal" as a municipal or other plant too small for advantageous use of a stoker, especially one of the over-feed type, the "Coal Feeder," which is the only type of stoker that can be properly designated as an "over-feed." It scatters the coal over the fuel bed on a flat grate.

Just why a stoker is not as advisable in a small municipal plant as in a non-municipal plant is not stated.

Mr. Schaphorst does not seem to be familiar with under-feed stokers, as he has asserted that "no stoker made can take

care of all grades of coal." It is, as he says, not only "almost impossible," but it is altogether impossible "to prevent some waste of unburned fuel" in the ashes, but it is possible to have as clean ash from a good automatic furnace as from any hand fire work. I quite agree that human attention is necessary, but the over-feed "Coal Feeder" referred to herewith will soon save cost of installation, and up-keep too, in any plant, even in a one-boiler plant.

The fuel economy advantages of stoker firing are obviously just as great proportionately in a small as in a large plant.

The Boston engineer's report and other cited tests of saving of stoker over hand fire are not phenomenal. There are scores of plants where the saving of fuel by use of automatic furnace amounts to 15 to 25 per cent or more, as shown on the monthly book accounts of fuel bills.

Among the "disadvantages" stated on page 327 is the following: "Generally stokers should not be installed unless it is also decided to handle ashes and coal automatically."

There are at least three times as many plants where stokers or "automatic" furnaces are in paying use without mechanical handling of ashes as where ash-handling systems are used, and at least twice as many plants equipped with what he erroneously calls "over-feed" or "opposed-feed" stokers, where neither coal- nor ash-handling is used, as where either is in use, and, when the stoker is properly operated, there has been no need of extra "manual labor" nor "mechanical agitators" to avoid clogging of coal in the feed opening or magazines.

Mr. Schaphorst's description of the form and operation of what he calls over-feed stokers is a mixture of error about two distinctly different types, viz., front-feed

and side-feed types. They are different in construction form, in operation and in results. He says over-feeds are more liable to smoke. The front-feed is, but the side-feed has no equal for continuous smokeless combustion, nor for economy of fuel and for crowding capacity, and this form has no dump grate, but is continually and efficiently kept clear of clogging by clinker and other refuse.

In the operation of what he designates as the "opposed feed type," it feeds from both sides, but rotatively from one side and then the other, instead of "simultaneously," and the coal does not "rest, for a short time" on plates "where the volatile gases are driven off." The plates referred to as "coking plates" are the bed-plates of the coal magazines. The coal is not coked until after it is pushed off these plates onto the grate. If coking took place sooner, it would be destructive of the adjacent parts of the magazine. There is no "lower end" to this form of furnace; exhaust steam is showered underneath the grates to prevent clinker from running or sticking to the grates, and incidentally it prolongs the life of the grates, which are the only parts in contact with the fire.

I do not care to note the statements about chain grate type nor "under-feed stokers," except to call attention to the evident attempt to make a virtue out of the necessity for carrying heavy fires, which is true of all fires driven by a blast, and to correct the error about higher temperatures. There is no possible higher boiler furnace temperature in an under-feed than in the side-feed automatic furnace, except that from lack of suitable suction draft there may be a cumulative heat effect, which is destructive of furnace walls.

Dayton, Ohio.

O. D. COTTON.

Our Schools Should Be Health Builders

We believe that our schools have met with a fair measure of success in inspiring moral living. We have assumed that children may and do improve in their study of arithmetic, geography, writing and reading. There is a general consensus of opinion, however, that our experiments in building healthy boys and girls have had few tangible and worthy results. We have never really expected that children would gradu-

ate from school in as good or better condition than when they entered. At the end of each year we have expected rather that they would be in a run-down condition. It is time we began seriously to consider the means whereby boys and girls will improve in health whenever it is necessary, in the same way that they improve in drawing or geography.

DR. J. MACE ANDRESS,
U. S. Bureau of Education.

Experience with Bituminous Gravel Streets

Methods of Constructing and Maintaining Streets in Richmond, Indiana

By D. B. Davis

City Civil Engineer, Richmond, Ind.

(EDITORIAL NOTE: *The following article came to THE AMERICAN CITY as a letter inspired by the article by Harrison L. House which appeared in the January, 1922, issue under the title, "Reinforcing Gravel Roads for Motor Traffic."*)

WHEN the streets of Richmond, Ind., were originally improved, the great local abundance of gravel led to the decision to use that material for the roadways. The gravel was laid to a depth of 12 inches. Cobblestone gutters were laid at the same time and were later replaced by a combined cement curb and gutter. Partly because of a slight difference in elevation of the outer edge of the new gutter and partly on account of the natural wear during a period of some 20 years, these streets became very flat, necessitating resurfacing.

It was the practice of the city to handle this resurfacing with crushed stone at its own expense, but in 1918, because of increase in the price of stone and in freight rates, resurfacing with that material became prohibitive, and, not wishing to discontinue the repair of streets, we decided to return to the use of gravel and to continue the

same methods that were used for macadam.

The gravel used was from the city pit and gave approximately the following screen test:

Passing a screen	Retained on screen	
1½-inch .....	.....	100.0%
1½-inch	¾-inch.....	11.7%
¾-inch	½-inch.....	6.7%
½-inch	¼-inch.....	16.9%
¼-inch	⅛-inch.....	17.3%
⅛-inch	50.....	29.4%
50 .....	.....	4.7%
Clay content .....	.....	13.3%

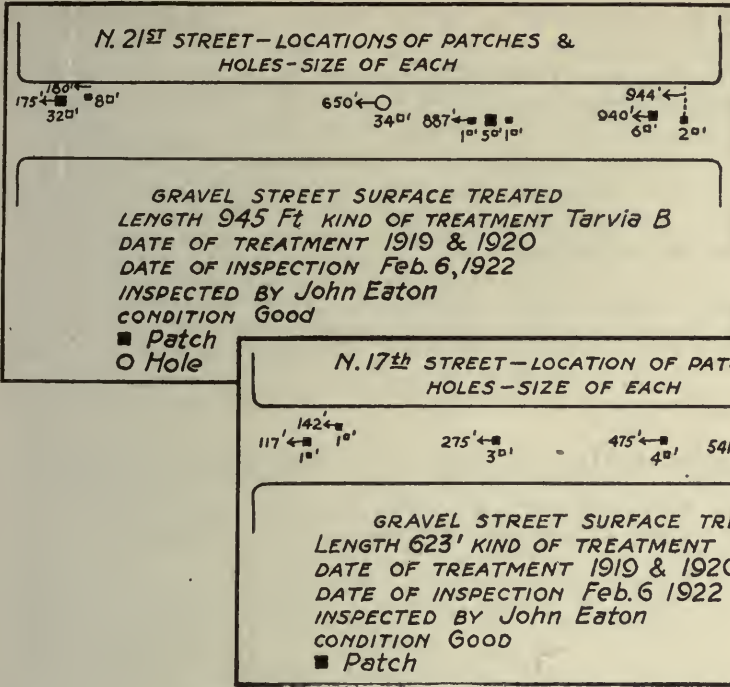
The clay appears as a coating on the pebbles and not as lumps in the mixture.

The following methods were used in constructing the gravel surface: The old worn gravel surface was first loosened to a depth of 3 inches by a scarifier attached to a 10-ton roller. The new bank-run gravel was spread in one course to a depth of from 4 to 5 inches. A finished crown of about ½-inch to the foot was attained. After thorough harrowing, the gravel was dampened and rolled. After once setting it with the roller, it was then more thoroughly wet and rolled to a finish. On the final rolling the surface was brushed by a steel brush attached to the roller; this was instrumental in filling the voids of the larger aggregate and giving the surface a smooth pebble-dash finish.

In 1919, it was determined to experiment with Tarvia B surface treatments on these gravel streets. North 21st Street and North 17th Street, comprising about 550 square yards, were the first ones treated. The success attained on these streets resulted in treating others each year,



NORTH 21ST STREET, A BITUMINOUS GRAVEL ROAD IN RICHMOND, IND.



PRINTS SHOWING RECORDS OF STREET INSPECTIONS

until at present there is a total of 50,000 square yards.

For successful results it has been our experience that the gravel surface must be hard and comparatively smooth prior to the application of the surface treatment. The application of these treatments the next season after construction allows traffic to more thoroughly compact the original surface. If small depressions are present at the time of treating, they are repaired by filling with 3/4-inch stone, tamping it about 3/16-inch below the street surface and sealing with hot *Tarvia X*. If there is dust on the surface, it can be removed to the gutter with a rotary sweeper. Otherwise, good results have been obtained by applying the material directly to the gravel.

The original bituminous material was applied cold by means of a pressure distributor. For the initial treatment, 1/3- to 1/2-gallon per square yard was used, with subsequent treatments of 1/3- to 1/4-gallon per square yard. After the initial treatment, when traffic has used the street for some months, a few depressions may develop, due either to an excess of dust or to a damp, clayey spot on the surface prior to the application of the binder. These are of little consequence, but must be repaired before the second application of the binder next

season. It is absolutely necessary that a second treatment be applied the next season, and if it is doubtful whether this can be done, it is not advisable to apply any surface treatments whatsoever on gravel.

Maintenance Charts

The accompanying charts show the maintenance required on North 21st and North 17th Streets, respectively, during the three years since 1919. No treatments will be necessary for these streets in 1922. After two successive applications of the original binder, additional treatment has been found unnecessary for from two to three years.

Richmond, Ind., has a population of about 27,000, and the gravel streets treated are those which are closely built up and are representative of the average residential cross-streets and not the thoroughfares.

The cost of resurfacing with gravel at present prices is approximately as follows:

	per cu. yd
Cost of bank-run gravel at the pit.....	.35
Hauling by teams, 6 loads per day, 1 1/2 yds. per load, team at 65 cents per hour.....	.72
Spreading on street at 40 cents per hour.....	.13
Extra man at pit loading at 40 cents per hour	.13
Cost of gravel on street.....	\$1.33
	per sq. yd.
Gravel delivered and spread at \$1.33.....	.29
5-inch finished depth req. 22 cubic yards scarifying and rolling with roller.....	.06
Cost of resurfacing .....	.35

The binder is applied by the city forces on petition by the people who reside on the street. A table of estimates is prepared and kept on file in the engineer's office giving the estimated cost of applying the binder to each block of gravel and macadam in the city. This table of estimates shows the width and length of each individual city block, together with the rate of cost per lineal foot and the total cost to the property owners for each block. This amount must be deposited with the city before any

work is started. In order to encourage the property owners to have the streets treated, the city has agreed to pay one-third of the total cost and all of the cost of intersections.

The following table gives the engineer's estimate for the initial treatment with binder, using one application of 1/4-gallon per square yard:

0.005 cu. yds. pea gravel covering at \$1.50	
per cu. yd.....	0.007
Binder f.o.b. track at 13 cents per gallon.....	0.033
Cleaning and application.....	0.015
Estimate per square yard.....	0.055

Catch-Basin Cleaning in Akron, Ohio

The Cost of Sanitary Cleaning Methods Greatly Reduced

EARLY in 1918 the city of Akron, Ohio, put into commission a machine of the hydraulic ejector type mounted on a 5-ton truck for cleaning its catch-basins. This Otterson Auto-Eductor cleaned 1,044 basins in the first seven months it was used. The average size of the basins was 4 x 5 feet x 7 feet deep, and inasmuch as many of the basins had not been cleaned for several years, they were filled up with dirt, and some of them even had grass growing on the surface.

In 1921, another Otterson two-stage Eductor, mounted on a Mack 5-ton chassis, was purchased. The table below gives interesting comparative figures on the cost of cleaning the basins, the average being \$2.94 per basin in 1921, as against \$3.50 per basin in 1918. These figures, which include the pay-roll, materials used, interest on investment, depreciation and overhead charges, are far below the cost of cleaning by hand, which averages \$5.00 per basin exclusive of cartage.

CLEANING CATCH-BASINS

STREET CLEANING, 1921

	No. 72 Kelly 5 T. Chassis - Otterson Eductor 1918 Model	No. 64 Mack 5 T. Chassis Otterson 2 Stage Eductor 1921 Model
PERFORMANCE:		
Number of Days Operated	63	192
Number of Hours Operated	710	1,580
Number of Catch-Basins Cleaned. 873		2,322
Dirt Removed—Cubic Yards.....	854	2,299
COSTS:		
Driver—Wages	\$1,100.50	\$1,200.70
Helpers—Wages	above	2,342.14
Gas and Oil	303.00	549.23
Total Operating	\$1,403.50	\$4,092.07
Repairs—Wages	100.15	382.24
Repairs—Parts	522.11	359.73
Total Maintenance	622.26	741.97
Tire Cost		
Depreciation @ 5 Years.....		1,237.60
Depreciation @ Actual Life, 3 Yrs.	820.00	
Interest	129.00	343.79
Total Capital Charges	949.00	1,581.39
Total Cost	2,974.76	6,415.43
UNITS:		
Cost Per Catch-Basin.....	3.41	2.76
Cost per Cu. Yd. Removed.....	3.48	2.79
Cu. Yds. Dirt Per Catch-Basin....	0.98	0.99
Catch-Basins Per Hour.....	1.23	1.47

Total Cost of Cleaning 3195 Basins..... \$9,390.19
 Cost Per Basin

Allowances of Supervision and Garage Rental not included,

Municipal Water Rates—Part I

A Thorough Analysis of Present Rates and Rate-Making

By E. E. Bankson, D. E. Davis and C. A. Finley*

THE development of scientific rate-making has followed the advent of the public service commission, which deals principally with the relatively small privately owned plants susceptible to considerations in operation which are often entirely submerged and of little importance in the operation of the much larger municipally owned plants. This paper is presented with the view of creating further interest in this much-neglected field.

The operation of a municipally owned plant affords the opportunity for rate-making on the basis of true equity, free from temptations to adopt policies of financial expediency appealing to privately owned plants. There are many elements in common to both plants creating influences in rate-making which are often reflected in widely varying results, due to the radical differences between the policy adopted by the directors of a private corporation and that followed by the legislators of a municipality.

The operation of privately owned plants in many states is under the jurisdiction of the public service commission, which permits a revenue sufficient to provide a fair return on the fair value of the property, in addition to operating expenses and an allowance for depreciation of plant. The reasonableness of rates imposed by a private water company would necessarily be measured by application of the rulings of the public service commission.

The operation of municipally owned plants is generally not under the control of

the public service commission, which fact admits that different principles are to be applied in the two cases. The duty of the commission is to protect the interests both of the consumers, as members of the community, and of the water company, as a private concern; but the consumers may exercise their control of a municipally owned plant through the power of their vote.

An opportunity for variation in municipal rates arises under the question as to the so-called ownership of a municipal plant, depending on the proportion of the investment contributed by property through tax assess-

A municipality may operate its water plant at a profit as a separate source of municipal revenue if it is disposed to do so and the law does not prevent. Such operation may favor the property owner who does not take water in proportion to the value of his property, such as vacant property or the extremely valuable property requiring a small quantity of water. On the other hand, if the plant be operated at a loss with the deficiency repaired from the general tax levy, the water taker or consumer as such would then be favored at the expense of the taxpayer.

ments as contrasted to excess earnings gathered from water revenue and invested in plant. The reader will here understand that this expression of so-called ownership is used as a convenient term to indicate the source of money that built the plant. Unless this factor is recognized in the building of the rate schedule, some discrimination may result towards one or the other of the contributors of the plant cost, that is, the property owner on the one side or the water consumer as such on the other side, and the equity of rates imposed by a municipal plant would seem to depend on this seat of so-called ownership.

A municipality may operate its water plant at a profit as a separate source of municipal revenue if it is disposed to do so and the law does not prevent. Such operation may favor the property owner who does not take water in proportion to the value of his property, such as vacant property or the extremely valuable property requiring a small quantity of water. On the other hand, if the plant be operated at a loss with the

* E. E. Bankson, of The J. N. Chester Engineers, Pittsburgh, Pa.; D. E. Davis, of The J. N. Chester Engineers, Pittsburgh, Pa.; C. A. Finley, Managing Engineer, Bureau of Water, City of Pittsburgh.

deficiency repaired from the general tax levy, the water taker or consumer as such would then be favored at the expense of the taxpayer.

The thought often exists in the minds of the layman that substantial justice will be done if all revenue is derived from water sales, since the consumer and the property owner are substantially one and the same. That this is not strictly true is evident when considering the extreme cases such as the valuable vacant property or the large office building which enjoys water service, fire protection, and increased property value out of all proportion to the relatively small charges for water used. This case shows a wide contrast with that of the very large consumer of water whose business is housed within a relatively inexpensive building or property.

The decision to operate a municipal plant at a profit, or at a loss, is, however, to be determined in part by administrative policy rather than entirely by scientific rate-making, but if accurate cost analysis is to play any part in the problem of rate-making, it must precede and remain separate from questions of administrative policy, except that the term "cost of service" may be subject to different interpretations according to the administrative policy obtaining, the purpose of cost analysis being to indicate or mould the correct administrative policy in this respect. Since the major purpose of this discussion is to determine "total cost of service" resulting in the "rate base," or the total "annual burden" and the equitable distribution of this burden to the various consumers of a municipally owned water plant, any mention of administrative policy in connection with cost is offered only as contributory.

Cost of Service

Cost of water service as deduced from the practice of public utility commissions in their control of privately owned plants is made up as follows:

- (A) Fair return on a fair plant value
- (B) An allowance for plant depreciation
- (C) Cost of plant operating and maintenance

wherein the items for "fair return" cover any profit permitted for the utility, and all three items are based on used and useful plant value.

This discussion of the absolute cost of service rendered by a municipal water plant

will not involve an item of profit, and consequently the item of "fair return" for a private plant will be replaced by an item which may be designated as interest on capital invested. As the so-called ownership of plant, bonded indebtedness, sinking fund, and interest rate paid may vary with each plant, it follows that the total cost of service will vary with each municipal plant, though the terms "depreciation and operation" carry the same meaning as indicated above, and this "cost of service" as distributed to the consumers through the medium of the rates charged will be further dealt with under the heading "Distribution of the Burden."

Ownership of Plant

There is no contention that the city does not own the plant, but there does appear to be a difference in equitable rates, dependent on the sources of funds for plant purchase, these being the general tax levy on the one hand, and the charges for water service on the other hand, as illustrated in the following comparisons.

The water-works plant of the city of Toronto, Canada, appears to be bonded to more than its present value, and that of Akron, Ohio, only slightly less, as indicated in the tabulation on "Plant Statistics," which means in a sense that the bondholders own the plant, and the cost of service must incorporate the total interest on the bonded debt, and unless the water revenue provides also a sinking fund for retirement of bonds, the water-takers as such will never hold any equity in plant account. If the operating revenue, in this case, should provide a sinking fund in addition to interest and operating costs, the rates would ordinarily need to be as high as, or higher than, those permitted for a private plant.

The water-works plant of the city of Erie, for the purposes of this discussion, may be considered free of debt, and since there are no interest or sinking fund charges to meet, one might easily and erroneously conclude that the water rates in Erie should be very much less than in Toronto. But such is not necessarily the case, for the reason that the water rates in Erie provide the only source of revenue for plant extension and replacements. In other words, the water-takers in Erie are paying for their plant as they go along, and for the past ten years this cost has been approximately equal to

6 per cent on the plant cost. This item, therefore, takes the place of interest and sinking fund for a bonded plant in the "cost of service" for Erie. If Erie should ever stop growing, however, and no further plant extensions be necessary, this item would disappear from the "cost of service" and the water rates should decrease accordingly, whereupon the advantage of this position would be more apparent. From the above discussion, it is evident that the water-takers have provided the funds for investment cost of the Erie plant, and in the spirit of this discussion we could say that the water-takers or consumers own the Erie plant.

The water revenue in many other cases is insufficient to carry the annual burden, and any bonds retired would indicate a credit to the general tax levy, which should entitle the tax levy to the regular city interest rate on all plant investment actually made, and in setting up the "cost of service" the general tax levy should receive a ledger credit for providing these funds, resulting in a corresponding charge to the water-takers which would appear in the "cost of service" distributed to the individual water accounts through the rates applied, public service and fire protection carrying a proper portion of the cost.

We understand that the present policy in the city of Cleveland is that the ownership of small distributing street mains and service lines to the curb is vested in the property owner, or he foots the bill and carries that entire burden by direct assessment, as for sewers or street paving, while in the city of Erie that total burden is carried by the Water Department, thereby creating a difference in the basis for equitable rates in the two cases. In the one case the consumer has gone down into his pocket and paid outright for his service line and street main, or, if a renter, he meets that burden through his house rent, while in the other case the burden of the items appears in the water rates, corresponding to return on investment, this variation resulting from the different location or seat of plant ownership of the items in question.

The city of Pittsburgh offers a third comparison in this respect, where the property owner assumes the burden of the service line and the Water Department the service mains. Or, again, a difference as to ownership of meters offers yet another compari-

son. The purpose of the foregoing comparisons is to support the statement that the rates charged for water in one city are no evidence of equitable rates to be charged in another city or in a private plant, but each case must be analyzed separately and stand on its own merits under the full conditions obtaining.

Again, in support of the thought that each schedule of rates stands alone, we tabulate deductions from replies to questionnaires sent to several cities. This tabulation indicates among other things that the bonded debt and resulting fixed charges vary from 0 to 100 per cent, that the plant value varies from \$19.75 to \$88 per capita, and that the operating cost varies from \$0.92 to \$3.22 per capita, or from \$18 to \$95 per million gallons.

Another deduction from this table is that an average plant value is slightly less than \$40 per capita, while the average operating cost for 1919 was slightly less than \$40 per million gallons, although this figure would be reduced in normal times.

It is entirely possible that there may be some discrepancies in interpretation of both questions and answers preliminary to the formation of this table, which would give erroneous results, but we have no evidence of error in the figures submitted and here use them as illustrative of this position. The results should remove any thought that water rates in different cities can be compared, because a comparison in total means nothing.

Service Rendered

The function of a water-works plant is admittedly two-fold—that of furnishing a water-supply for general consumption and for fire protection—and since this discussion is based on the principle that "the rates charged for any service should be in proportion to the cost of such service," it becomes necessary to make a careful analysis of all functions and duties assumed by the water department and of all service rendered.

Fire protection service is rendered to property or to property owners in proportion to the value of the property protected, and charges should be entered directly against the property or against the general tax levy. General water service is rendered to persons or industries largely in proportion to the water delivery, with no necessary

WATER PLANT STATISTICS FOR 1919-1920.

City	Population	Plant Value	Bonds Outstanding	Plant Value per Cap.	Operating Cost	Operat. Cost per Capita	Number Consumers	Operat. Cost per Cons.	Mill. Gal. Daily	Operat. Cost per Mil. Gal.
Cleveland.....	990,000	\$28,000,000	12,000,000	\$28.39	\$953,936	\$0.97	108,702	\$8.75	127	\$20.50
Toledo.....	260,000	12,500,000	1,915,000	48.00	382,335	1.47	45,500	8.40	28	37.30
Buffalo.....	510,000	19,198,490	12,847,492	37.60	890,948	1.74	76,258	11.70	136	18.00
Akron.....	160,000	10,000,000	9,000,000	62.50	267,000	1.67	32,000	8.35	20	36.50
Milwaukee.....	500,000	10,000,000	195,000	20.00	458,973	.92	66,422	6.92	61.9	20.40
St. Paul.....	250,000	7,443,707	2,407,000	29.75	247,722	.99	46,000	5.40	17.6	38.60
Youngstown.....	132,000	2,610,887	763,200	19.75	276,294	2.09	21,169	13.16	12	63.00
Toronto.....	499,276	16,000,000	16,209,316	32.00	1,150,599	2.30	104,766	11.00	75	42.00
Syracuse.....	171,000	15,000,000	4,105,000	88.00	249,395	1.45	25,450	10.00	27.5	25.00
Detroit.....	1,108,735	23,583,428	2,855,114	21:20	1,159,333	1.05	164,779	7.00	152	21.00
Sandusky.....	30,000	.....	.....	.....	60,615	2.00	5,600	10.70	4	41.50
Indianapolis.....	267,000	10,000,000	Private	37.50	.....	.....	46,080	.....	29	.....
Albany.....	112,568	3,099,000	1,520,850	27.50	360,100	3.22	20,674	17.50	20	49.30
Rochester.....	295,850	13,800,000	10,445,000	46.70	867,000	2.92	49,484	17.50	25	95.00
Canton.....	90,000	3,000,000	1,500,000	33.30	.....	.....	22,000	.....	13	.....
Pittsburgh.....	547,000	32,000,000	10,698,392	58.50	1,422,762	2.60	91,617	15.50	118.4	32.80
Duluth.....	98,000	3,650,776	2,424,000	37.20	98,587	1.00	13,401	7.35	9	30.00
Eric.....	110,000	3,755,000	.....	34.10	310,000	2.80	19,000	16.30	20.4	41.60
Minneapolis.....	300,000	11,000,000	1,750,000	36.70	.....	.....	61,000	.....	27.5	.....
Williamsport.....	45,000	1,600,000	Private	35.50	77,141	1.71	11,000	7.00	8.5	24.86
Totals.....	6,476,429	\$226,241,288	\$90,635,364	\$734.19	\$9,232,740	\$30.90	1,030,902	\$182.47	931.8	\$637.36
Average.....	.....	.....	.....	\$38.60	.....	\$1.82	.....	\$10.70	.....	\$37.50

relation between value of property and quantity of water delivered; therefore, to make a proper accounting for all service rendered, the charge for water cannot properly cover fire protection, for there is no necessary relation between the two, and in fairness to all concerned, a charge for fire protection must appear separate in a complete set-up for equitable rates.

Providing a water-supply for fire protection service creates an increase in plant investment and in plant operation over and above the cost which would be sufficient for general water service. The exact cost of fire protection service has been somewhat in doubt within the limits of the two methods of competition used, that is, the excess method and the proportional method, but after a careful analysis has been made of

the fire protection service rendered by any plant, a cost for this service can with fairness be established and a charge indicated. In the case of the city of Pittsburgh, the ratio chargeable to each service was obtained from available records of actual demands, and the result was fairly checked by the equation proposed by Metcalf, Kuichling and Hawley in the 1911 Proceedings of the American Water Works Association.

General water service may first be separated into two groups, as public service and private service. If the tax levy carries the burden of plant investment, this may amount to more than the cost of the public service received by the city and by property in general, in which case the ledger should

(This discussion of the making of meter rates will be continued in the April and May issues.)

A Chance for National Economy

Business and financial leaders are telling the public to stop waste, and to work and save in order to restore sound conditions. The public could make a good beginning by stopping the preventable fire waste of the country, which is estimated to have amounted to \$500,000,000 last year, or approximately \$1,370,000 a day. Carelessness and ignorance normally figure as the chief causes of our fires, but there is also the mistaken be-

lief of many that when property is insured against fire the insurance companies are the only ones to worry if it burns. As a matter of fact, insurance costs are so closely interwoven with our social and economic fabric that we are all affected by the fire waste.

The careless or ignorant citizen responsible for a fire taxes himself as well as his fellows.

Diesel Engine in Light and Water Works in Freeport, N. Y.

By Stanley Wright

THE village of Freeport made its original water-works installation in 1894. This equipment sufficed until about 1898, when electric lighting equipment was added consisting of two 70-horse-power return tubular boilers, two 50-arc-light machines, and one 37½-k.w., A C. generator. Since 1898, additions have been made to the plant continually, so that in 1920, when the population of the town was about 12,000, the power-house contained the following units: four 200-horse-power boilers,

one 300-k.w. generator direct-connected to a Hewes & Phillips single-cylinder Corliss engine, one 200-k.w. generator belted to a single-cylinder Fishkill Corliss engine, and one 100-k.w. generator belted to a single-cylinder Fishkill Corliss engine, totaling 600 k.w. in maximum capacity; the generators being all alternating current, 1,150-volt, 3-phase, 60-cycle machines. The steam pumping equipment consisted of two one-half-million direct-acting Worthington steam pumps.

In 1920 the load was running approximately as follows: during the day an average of about 200 k.w.; during the evening about 500 k.w. when both street lights and domestic lights were on; and about 160 k.w. after midnight when the principal load was street lights alone. This street lighting is with arc lamps in the usual series system, requiring constant current transformers at the power-plant to regulate the voltage in accordance with the number of lamps in use, so that the same current is always maintained. These arc lamps as they become worn out are being replaced by nitrogen-filled incandescent lamps.

The water pumping in 1920 averaged 500,000 gallons per 24 hours, which is



INTERIOR OF FREEPORT, L. I., POWER-PLANT, SHOWING DIESEL ENGINE INSTALLATION

lower than for the average town of this size, and is accounted for by the fact that there are several independent wells scattered about the town from which many families obtain their supply.

The power-house is next to the railroad, about a half-mile west of the station, close to the wells from which the city water is drawn, and a 293,760-gallon stand-pipe is located next to the power-house and directly connected to the mains, so that the pumps work against an average head of 155 feet, which is the approximate level of water maintained. The village fire department owns both steam and motor fire engines, so that in case of fire the pressure from the mains is supplemented by that of the fire apparatus.

The Need for New Equipment

In 1920 the electric rates for house lighting were on a flat basis of 10 cents per kilowatt hour, street lighting being paid for by taxation. During the summer of 1920 it was becoming evident that additional power equipment would have to be installed because the load had increased to a point where during the evening peak all the units in the plant were running at full capacity

and there was nothing in reserve. A study of this increase in load since 1898 showed the interesting fact that the demand for electricity had practically doubled itself every four years, and during 1920 was increasing at a still faster rate. It became imperative to have additional generating equipment as soon as possible, so the Village Trustees immediately began an investigation to ascertain what type of new equipment would be best to install for their conditions.

The Diesel engine had been suggested, but at first there was some skepticism concerning the feasibility of putting in such a machine to run in conjunction with existing steam equipment. After very careful investigation extending over a period of two or three months, supplemented by personal visits to some Diesel installations, the Board became convinced that it would be the most advantageous thing to do. It was found that a new Diesel engine generating unit could readily be placed in the existing power-house without an addition to the building; that it would operate in parallel with the existing steam engines; and from the Board's inspection of other Diesel plants they felt sure that considerable savings could be made over "all steam" operation.

The Board purchased a 365-b.h.p. vertical, 4-cylinder Busch-Sulzer engine with a 250-k.w. direct-connected General Electric alternator. The installation was completed in the spring of 1921, including a 45-foot overhead hand travelling crane of 10-ton capacity; also, a panel was added to the switchboard, and the arc-light transformers were transferred to a platform especially constructed in the engine-room.

Since the new unit was put in regular service it has been running on a 24-hour schedule, including Sundays. In general, the engine is run two weeks without a stop, and some longer runs of thirty full days have been made. It is of special interest to note that since the Diesel engine has been installed it has been operated fully 95 per cent of the total elapsed time, including Sundays and holidays. In other words, instead of keeping the Diesel unit to carry over peak loads and for emergency, the steam equipment is kept for this purpose, and the Diesel grinds away on steady load both day and night.

The savings over previous operation by steam alone are greater than had been an-

ticipated, and the records show that the new unit has been giving Freeport a net saving of over a thousand dollars for every month, compared with the previous cost of current generated by steam alone. The two direct-acting steam pumps are now being replaced by 40-horse-power and 60-horse-power Alberger centrifugal pumps with G. E. motors.

Operation of the Engine

The engine-generator unit forms a complete power-plant in itself on a single foundation. Aside from its economy of operation, this type of prime mover is advantageous in requiring no boilers or boiler-room equipment, nor the building space and labor for it. Moreover, it is clean, compact, readily accessible, and has no standby losses. The same operators who take care of the steam engine take care of the Diesel, so no additional labor is required.

The fuel oil storage capacity consists of one 10,000-gallon and one 12,000-gallon underground tank, located just west of the plant and on a railroad siding. At these tanks there is a motor-driven pump, also an emergency steam pump for transferring the oil to the engine-room auxiliary tank. The pipe in which this oil is transferred is laid in a small trench, concreted and covered, in which there is also laid a steam line so that in extremely cold weather it can be kept sufficiently warm to prevent any stoppage of fuel due to congealing from low temperature. The motor-driven pump is controlled by a small switch in the engine-room on the wall beneath the auxiliary tank, so that as soon as this tank is filled the operator cuts off the motor. From the auxiliary tank in the engine-room the fuel flows by gravity to the pump on the engine, and from there it is delivered to the fuel valve of each cylinder. As the fuel valves open, a blast of air from the compressor forces the fuel through the atomizers into the cylinders. In full Diesel engines pure air only is compressed, and by compression becomes sufficiently hot to burn the finely divided fuel as it is forced into the cylinder by the air blast, incidentally eliminating any electrical ignition system or other ignition device. To start the engine there are provided two starting air tanks, in which air is kept stored at high pressure at all times. The air for fuel injection, which must necessarily be at a higher pressure than the

PLANT OPERATING RECORD
VILLAGE OF FREEPORT, LONG ISLAND, NEW YORK

1921	KWH Generated in Month			Fuel Consumption		Fuel Cost			Total	Cost for all Steam Operation— —Basis 5.53 Lbs. Coal Per KWH. (economy of previous all steam plant)	Net Saving Per Month
	Diesel	Steam	Total	Gallons Oil—Diesel	Pounds Coal—Steam	Diesel Oil @ 7c.	Steam—Coal @ \$8.35 per 2240 lbs.				
June	91,070	27,317	118,387	10,068	288,126	\$700	\$1074	\$1774	\$2440	\$666	
July	94,610	30,981	125,591	10,242	278,946	717	1040	1757	2590	833	
August	107,430	35,680	143,110	11,513	324,440	806	1210	2016	2950	934	
September	110,320	45,321	155,641	11,480	338,472	804	1263	2067	3210	1143	
October	112,700	81,139	193,839	11,898	503,460	832	1875	2707	3990	1283	
November	123,500	85,888	209,388	12,916	495,072	903	1845	2748	4320	1572	
December	128,050	112,997	241,047	13,190	569,664	923	2122	3045	4970	1925	

compression in the cylinder, is furnished by a three-stage air compressor directly driven from the main crank-shaft of the Diesel engine.

The system of lubrication on the Freeport engine is one deserving of close attention; all engineers know that this feature is of the highest importance for the successful and continuous operation of any engine. Most of the troubles with Diesel engines of earlier design can be traced directly or indirectly to faulty lubrication. On the engine at Freeport there is provided

a completely enclosed forced feed system in which the oil is circulated under regulated pressure to all the main bearings, crank pins and piston pins. After leaving these points it drains from the engine bed plate through a two-way filter, and after passing through the cooler located under the filters is again pumped into the system. Oil for the pistons is provided by forced feed mechanical lubricator, the distributing lines feeding oil to six points on the circumference. The cam shaft is entirely housed in, and the cams dip in an oil bath.



Courtesy Electrical Merchandising
TWO DANGERS TO HIGHWAY TRAVEL AT NIGHT—THE BLINDING HEADLIGHT AND THE ONE-LIGHT CAR

Proper highway lighting would eliminate both dangers, not to mention others

Suggested Ordinances for Interim Zoning

By Edward M. Bassett

Counsel, Zoning Committee of New York

AFTER the Legislature had empowered New York to establish zoning regulations, and a commission had been appointed, insistent requests came from many localities to protect them pending the preparation and adoption of the all-city plan. Private one-family dwelling restrictions in Fiske Terrace expired January 1, 1916, and this locality petitioned the Zoning Commission for immediate protection against stores. The Commission refused, because such piecemeal zoning treated certain selected land preferentially and was therefore dangerous, because it might have started zoning with a critical lawsuit, and because first one locality and then another might be thus protected and withdraw its assistance from the comprehensive plan. Before the zoning resolution went into effect on July 25, 1916, a row of brick stores was erected, injuring Fiske Terrace somewhat. If, however, piecemeal ordinances had been passed for this and other petitioning localities, the comprehensive plan would have been delayed and perhaps defeated.

Although one may not recommend any method of preliminary zoning, one may perhaps point out the line of least danger. Piecemeal zoning should be avoided. Interim zoning of a comprehensive or all-city sort is safer. Here is an example:

"Wherever four-fifths of the frontage of the lots on any street between two intersecting streets contain at the time of the passage of this ordinance structures exclusively residential, no structure shall be built or altered for business or factory purposes therein."

Such an ordinance is at least comprehensive. It covers the whole city and after a fashion treats all alike who are similarly situated. If the Legislature has given the city the power of zoning, the courts would be quite likely to uphold such an ordinance, except perhaps in some particular case of extreme hardship. It has the demerit that all preliminary and quickly written zoning ordinances must have—it is arbitrary. The matured zoning maps will recognize the different needs of different residential streets and will take away nine-tenths of the arbitrariness.

The suggested form can be altered as regards the fraction, the present use, and the prohibited use. It may be adapted to set-backs. It is merely to illustrate the direction of safety. The provision fixing the status of the protected district as of the time of the ordinance prevents what may be called traveling districts or set-backs. Most interim ordinances have allowed the district to be altered by the erection of new buildings or the destruction of old ones. This transitory application of the police power has undoubtedly affected adversely the views of the courts in some cases.

There is always a temptation to make an interim ordinance adaptable to each locality by introducing a majority consent. Here is an illustration:

"Wherever four-fifths of the frontage of the lots on any street between two intersecting streets contain at the time of the passage of this ordinance structures exclusively residential, before a permit shall issue for any building or alteration for business or factory purposes therein there shall be on file with the building commission the written consent of the owners of three-fourths of the entire frontage."

Such a provision is ineffective and the courts will set it aside. Police power regulations are governmental and not like contracts between persons. Majority consents of owners cannot give an official the power to regulate. The local legislature must do the prohibiting.

The United States Supreme Court has, however, declared that, if the police power regulation prohibits the objectionable structure, a provision for a majority consent to make an exception does not invalidate the ordinance. The following ordinance is submitted as comparatively safe:

"Wherever four-fifths of the frontage of the lots on any street between two intersecting streets contain at the time of the passage of this ordinance structures exclusively residential, no structure shall be built or altered for business or factory purposes therein, unless the written consent of the owners of three-fourths of the entire frontage shall be on file with the building commissioner at the time of the issue of a permit."

An interim ordinance should always refer to the zoning enabling act in its preamble.

Insuring the Maximum Life of Block Pavements

By A. J. Moynihan

THERE are millions of yards of blocks laid each year, and in the construction of block pavements, whether granite, wood, or brick, one feature which always demands the most careful consideration is the filling of the joints. Filling the joints either adds to or detracts from the average life of the pavement. The completed pavement will give results in proportion to the type of filler and the method of application; therefore, as much care should be exercised in the selection of the filler as is taken in the selection of the blocks.

The consensus of opinion among engineers and road builders is in favor of the so-called flexible fillers. The reason for this is that the filler must be of such a nature as to allow for expansion and contraction of the blocks due to climatic and temperature changes and to moisture. Experience has demonstrated that a properly prepared asphalt is one of the best fillers; however, the mere fact that a flexible filler is specified does not mean that the problem of filling

the joints is solved, as there are characteristics which the filler itself must possess, as well as provisions which should be included in the detailed construction specifications for the proper methods of application.

In order to secure most satisfactory results, the filler must be of relatively high melting-point, adhesive, and malleable; a product which will not soften materially when subjected to high temperatures nor become brittle at low temperatures. It must be wear-resisting and impervious to water and street liquids. An asphalt filler of this nature properly applied at a temperature of between 350° and 425° F. by a combination of the poured and squeegee methods for granite block because of their depth, and by the squeegee method alone for brick and wood block, will insure long life to the pavement.

In applying the asphalt filler, the filler gang should follow the pavers as close as possible, and in no case should they leave the pavement over night without completely



APPLYING A FLUSH COAT TO GRANITE BLOCK PAVEMENT ON SECOND STREET, CINCINNATI, OHIO

The flush coat consisted of equal parts of Texaco asphalt and sand by volume



THE FINISHED PAVEMENT ON SECOND STREET, CINCINNATI, OHIO

On this job the joints in the granite block pavement were three-quarters filled with pebbles and asphalt. The work was finished with a mastic flush coat, which filled the joints and left a thin protective mat on top of the block

filling the joints. In case of rain, the pavement should be covered with tarpaulins so as to keep water out of the joints before application of the filler, as it is essential to have the joints dry and clean before pouring the asphalt.

Methods of Filling Joints

Granite block.—Clean, dry pebbles passing a ½-inch screen and retained on a 3/16-inch screen are hand-swept into the joints. The blocks are then rolled with a tandem roller (either 8- or 10-ton) so that the pebbles are shaken to thoroughly key the blocks, leaving the joints about two-thirds filled. The asphalt filler is then poured into the joints until the voids in the pebbles are completely filled and the asphalt is within an inch of the top of the blocks. A flush coat made up of equal parts, by volume, of clean, dry, fine sand and asphalt agitated so as to be thoroughly mixed, is floated over the entire surface of the pavement, completely filling the joints, leaving a light coat of the mix on top of the blocks. A ¼-inch covering of dry pebbles, passing a ¼-inch and retained on an ⅛-inch screen, is then evenly applied over the surface. The completed pavement can be opened to traffic immediately.

Brick.—After the brick have been thoroughly rolled, they should be swept clean by hand brooming. The joints should be com-

pletely filled with an asphaltic filler applied by the squeegee method. In floating the asphalt over the surface of the brick, sufficient material is allowed to remain on the brick so as to form a carpet coat. A covering of dry, coarse sand is then evenly applied over the entire surface.

Wood block.—Best results are obtained by floating the asphaltic filler on the surface of the blocks, squeegeeing back and forth until the joints are completely filled. A covering of clean, fine, dry sand is then evenly applied over the surface.

Preparing the Filler

There are many details which should not be overlooked in preparing a flexible filler for application. One of the most important features is the heating. The material should be heated at a uniform rate; upon reaching the temperature where best results can be obtained, between 350° and 425° F., depending on the season of the year, the filler should be applied as soon as possible. When it is necessary to hold for any length of time material which has been heated in the kettle, the fire should be banked and the material agitated from time to time so that there will be no danger of coking or overheating, as this tends to harden the material. The heating kettle should be fitted with a thermometer, so that uniform heating is as-

sured and the material is applied at the proper temperature.

To properly charge a kettle, the asphalt, which is shipped in drums or barrels, should be quartered and placed in the kettle so as to half fill it. A slow fire is then started. As soon as the asphalt is melted sufficiently to cover the entire surface of the bottom of the kettle, the fire can be gradually increased and the kettle completely filled. The filler should be agitated at regular intervals throughout the heating to avoid burning.

Many users fill a cold kettle with material and then fire it as hard as possible in order to melt the filler quickly. This is very bad practice, as it will warp the kettle and ruin it in a very short time.

The kettle should be kept clean from carbon and sand which collects on the bottom; otherwise this crust acts as an insulator, confining the heat, rendering it difficult to melt the asphalt, and causing the bottom of the kettle to burn out, greatly shortening the life of even the best kettles.

The Value of an Efficient Fire-Fighting Organization

Training and Organization of Dubuque, Iowa, Fire Department Greatly Reduces Annual Fire Loss

By L. J. Jellison
Dubuque, Iowa

WITH a population of 42,000 and a fire department which has been practically reorganized within the last twenty months, Dubuque has held its fire loss down to \$75.72 per fire for the last year. The fire department records show the following data for the years 1916-1920:

	No. of Fires	Loss	Average Loss Each Fire
1916.....	220	\$642,000	\$2,918
1917.....	226	226,000	1,000
1918.....	258	55,000	213
1919.....	311	374,000	1,203
1920.....	82	502,813	1,735

In January, 1921, the city, operating



A CRACK COMPANY OF THE DUBUQUE FIRE DEPARTMENT WITH ITS AMERICAN-LA FRANCE MACHINE

under the city manager form of government, placed an experienced fire fighter in charge of the department. Chief Joseph Fisher's records for the period March, 1921, to December 1, 1921, showed 240 fires, total loss \$18,173; average loss per fire \$75.72. This record indicates a potential saving in fire loss, basing the deduction on the losses in previous years, amounting to \$373,507.20 for eight months, or \$560,260.38 for twelve.

The Reorganization

Before the advent of Chief Fisher, the Dubuque Fire Department was completely motorized, yet it was inadequate, for the want of trained men to handle the equipment. There were ten pieces of apparatus, with two men, not counting the officers, to each machine. The first thing that the new chief did was to ask for more men, and twenty new men were added to the force. Then the department was reorganized, and men who had served between 20 and 32 years were asked to resign and were placed upon the pension roll.

A training course was instituted, including ladder climbing, laying hose, spotting pumps at hydrants, ladder raising, and carrying of hose. Each company was brought down to headquarters daily to train. And then, in order to increase the

interest of the men in their work, inter-company contests were held. The various companies reached such a degree of efficiency that it was decided to hold a public demonstration and contest. Business men offered trophies for the winners of various contests, such as making a long run, coupling to a hydrant, laying 200 feet of hose and throwing water, also ladder climbing and hose coupling.

The training of the men included mental as well as physical exercise. An athletic director was appointed, and certain periods of the day were given over to wrestling, boxing and bag punching. A school was organized and lectures were given by captains and other officers of the various companies. Mondays and Tuesdays were devoted to examinations, and the men were given written tests on the location of hydrants, prominent buildings, elevators, fire-escapes and exits of various buildings, fire alarm boxes, sprinkler alarms, etc. The city was divided into districts, and a test was given on each district. That Dubuque has definitely proved that efficiency in a fire department, coupled with thorough inspection by uniformed members of the force, is well worth while, is demonstrated by its fire loss of only \$75.72 per fire since the reorganization of the Fire Department.



HOW SOME PARK DEPARTMENTS ARE REPLACING DECAYING TREES AND THUS PRESERVING THE BEAUTY OF THE PARK AREA

Fraser Town—A Plague-proof Town in India

Sanitary Improvements at the Civil and Military Station of Bangalore in the Mysore Province, South India

By J. H. Stephens
Engineer, Bangalore, India

IT was in 1898 that plague first broke out in Blackpully, India, in its most virulent form. It afterwards continued in a milder degree, making its unwelcome presence felt every cold season, when it claimed the most victims. The construction of Fraser Town—a plague-proof town—was

a kind of spell upon them, for while so many Mohammedans died, the plague hardly touched the English. It took some time for these people to understand that the principal cause of all the trouble was insanitary habits and manner of living. The uneducated Hindu mind is very superstitious.



A GENERAL VIEW OF A CONGESTED INDIAN CITY WITH CLOSELY ABUTTING HOUSES

not sanctioned till the beginning of 1906. This interval of eight years was not lost. The plague was carefully watched year by year and its peculiarities were studied. Nearly every plague-infected house was minutely inspected, and an intelligent reason ascertained as to why the plague had afflicted that house in preference to those around it, and thus this vile pestilence betrayed itself and it became possible to adopt rules for its permanent exclusion.

The scenes of sorrow and distress one witnessed when inspecting the plague-infected houses are indescribable. The more ignorant class thought that the English were working

Evil and good spirits enter into all his social and domestic relationships. It was therefore necessary to assure him that the Plague Demon and the other demons of Hindu diseases would be effectually excluded from this new town in which he was invited to locate. The plague has not been an unmixed evil. It has shaken the faith of the people in the protecting and purifying efficacy of rites and sacrifices, and prepared them for the gospel of fresh air and sanitation.

A little consideration of ancient Hindu town planning and town building will show how great was the spell of superstition



BLOCKS OF BUILDINGS UNDER CONSTRUCTION IN FRASER TOWN

which obscured the naturally acute Indian mind, and the ancient nature of the covering made it all the more sacred and secure and difficult to remove. Ancient Hindu town planning and town building are found in old mutilated manuscripts, difficult to decipher and hard to explain, except by learned pundits. They were said to contain revelations made by the deities at different times to Rishis, or holy men who lived in the earliest days.

Except for the small minority of the educated classes, India was very much as it was centuries ago. Rites and sacrifices were still considered the purifiers of a town, and impure and filthy surroundings were contemplated with passive calmness as almost a necessary part of existence. Any change was looked upon as an unhealthful break of old traditions. Till the plague came! This dreadful experience convinced the Hindus as nothing else could have done. They saw that the English people living in their new town, but under better sanitary conditions, were almost untouched by the plague, while Indians died in thousands, so the more wealthy who could afford it rushed off to live in the English sections of the town. There was nothing in the rules of the land to prevent their doing so. It was only their caste prejudices which kept the Indians together, but the law of self-preservation was found to be stronger than the law of caste. Thus the plague was not only a teacher, but a reformer.

The Plan of Fraser Town

The relief of congestion in the Indian sections of Bangalore could not be started till accommodation was found for the evicted people in some other locality. About

50 acres of high agricultural land about $1\frac{1}{2}$ miles north of Blackpully were acquired for building about 500 houses, most of which were intended for the poorer classes. The site was well chosen, it was well drained with falls of about 1 in 75, so that the drains would have self-cleaning slopes, and it was higher than most other parts of Bangalore. It was bounded by the railway on the north and by important public roads on the other three sides. The soil consisted of red loam for the upper 2 feet and hard gravel beneath. Its greater length faced south, the direction of the prevailing breezes, so that it was a high, well-drained, wind-swept, healthful locality. This tract was broken up into one-acre building blocks by intersecting roads and streets. The main roads were made 99 feet wide; the other roads were 66 feet and the streets 33 feet. Each acre was divided into 20 building sites, and sold under certain conditions and rules. Those who desired it could build a larger house on two plots only. More than two plots was not allowed for one house. This gave 2,178 square feet for the smaller plots, and 4,356 square feet for the larger plots. Of these areas, only one-third was to be built on, and two-thirds was to be kept as an open space all around the building. That is, for the smaller houses 726 square feet would be the area of the building, and 1,452 square feet the open area all around the building; in the larger houses 1,452 square feet would be the area of the building, and 2,904 square feet the open space all around the building. In practice this worked out that the larger houses were at the ends of the block and the smaller houses in the middle, as shown in the photograph of blocks under construction.

The areas for the new buildings were decided on after carefully measuring up the spaces actually occupied by the poor in the congested parts of the town and allowing a certain proportion of increase. There was some difficulty in carrying this out. Some purchasers of plots did not understand why they should not cover the ground entirely with buildings, as used to be done in most other places. They had to be reminded that this was one of the rules on which land was sold to them, and it required great watchfulness to see that the rule was not broken. In modern times, when garden cities are building almost everywhere, with open areas around each house, that which has been described may be considered as ordinary sanitary improvements, but sanitary advances have to be combined with the plague-proof rules to make them effective, as will be described.

Fleas on dead rats or squirrels convey the plague to man. They are the propagating medium, and not the originating cause of plague. The germinating cause infects the rodent, and the flea from the rodent conveys the disease to man.

The "Plague-proof Rules"

Continuous observation for about seven years connects moisture, stagnation and damp with the originating cause of plague in Bangalore. Therefore, the first and most important plague-proof rule which was to

make and keep Fraser Town free from the plague was that it should be free from damp. For this reason all its roads and its streets were countersunk about 1½ feet below the level of the natural ground. This made the one-acre building-blocks like hillocks surrounded by the countersunk roads and streets. Even the natural percolation in the upper soil was cut short at each acre-block by the countersunk roads and street, thus keeping the buildings quite dry even after the heaviest rains. This was the first and most important plague-proof rule.

The second rule extended from the originating cause to the propagating medium. It ordered that the basements of all the houses were to be not less than 1½ feet high and were to be built of coarse granite rubble jointed with good cement. Coarse granite rubble is both plentiful and cheap in Bangalore, so that this rule was no hardship to the builders. Many Indians do not care for high basements, as they destroy that privacy which they consider so important for their women. The plague-proof reason for the stone basements was to prevent the rat from burrowing into the houses; also, it helped in keeping the house dry. An ordinary sanitary improvement and the plague-proof rule in this case ran together.

The third plague-proof rule was that the floors of all the houses should be of stone slabs, or of hard, compressed tiles, so that rats might not burrow holes through the



TWO COMPLETED COTTAGES IN FRASER TOWN, WITH THE OWNER

floor, or vermin of any kind find lodgment in it. This rule many considered a great hardship in houses intended for Indians. The orthodox Hindu had an old-time way of making floors, in which religion was mixed up with a dirty habit. But Fraser Town was to be kept pure by sanitation, and not by old religious rites, and so the stone floors were insisted on—and stone was cheap. These floors contributed to making the houses rat-proof and vermin-proof, and thus plague-proof.

The fourth and last plague-proof rule was that all the roofs should be covered with Mangalore tiles. This is the old Roman interlocking tile. It is water-proof, but not air-proof. All its joints are open. No cement or mortar or nails are needed in its fixing. The air passes freely through the joints and keeps up a continual circulation day and night. The houses are provided with abundant doors, windows and ventilators. Indians have a way of keeping these safely closed, but they cannot close the joints between the tiles, and so circulation goes on continually, and the people are learning to appreciate its value.

It is now about twelve years since Fraser Town was erected as a plague-proof town. Sir Harcourt Butler, the then head of the Sanitary Department for all India, said at the first All-India Sanitary Conference,

“Fraser Town is the only plague-proof town in all India.” Many from other places in India wished to know how this was done, and explanations were given. The good people who built the houses in Fraser Town were principally Indians. It was brave of them to risk their money in building on these new and untried rules. It has turned out a great financial success. Whenever there is a plague anywhere around, people flock to Fraser Town as to a city of refuge, and it has not disappointed them. What is perhaps also very important is that the poorer class of Indians are being taught a new manner of living. The children are strong and healthy. Each one has his own little yard to play in and appreciates it; it is not now necessary to play in the gutter.

After a trial of 12 years, Fraser Town has passed the period of apprenticeship. There should now be no going back to the old Indian method of erecting abutting buildings with no voids between. This is an ordinary sanitary improvement known all over the world, and land is comparatively cheap in Bangalore. The plague-proof rules supply a special want, and should be observed in all plague-infected countries, though they also help in improved sanitation and may be adopted in a modified form to suit special places where new towns are projected.

Port Development

NEARLY all the large cities of this country are located on navigable waterways, many of them being situated on deep estuaries leading direct to the ocean. The World War resulted in the creation of a great international trade between this and foreign countries. To maintain this trade successfully in competition with other countries, it is necessary that the most modern facilities for handling and shipping goods shall be provided. Port authorities in every city on the Atlantic, Pacific and Gulf Coasts, and on our Great Lakes, anxious to share in this foreign trade, have been actively engaged during the past few years in developing their terminal facilities and are now planning greater extensions to handle the additional water-borne cargoes. In order that a port may compete in the world trade, it is essential that provision shall be made in the planning of the city for the great trunk railroads to

reach the water-front, either directly or over a belt line railroad system, so that the cars may deliver cargo at the ship's side. It is also necessary that a system of traffic streets shall be laid out and developed in the rear of the piers and along the water-front, to give highway facilities for motor trucks and vehicles to make deliveries to and from the industries, warehouses, and stores located in the vicinity of the water terminal.

The authority to plan and administer the ports of this country is vested generally in the officials of the city, although there are several instances where ports are under the control of state commissions; but in all cases the development of the land side of the port is a proper task for men skilled in both city planning and other municipal work.—“Municipal Engineering,” George S. Webster. Trans. Am. Soc. C. E., 1921, page 516.

Forward Steps in Municipal Affairs

Police Departments

The Duties of a "City Mother"

LOS ANGELES, CALIF.—After many years of experience in police and juvenile work, the writer conceived the idea of a confidential office located away from the depressing atmosphere of Police Headquarters, where troubled parents might come for advice and assistance in the management of children who were beyond their control, thus saving to society many children who might become a menace or a burden.

The title "City Mother" has inspired confidence in the hearts not only of parents but of boys and girls as well, who might, through reticence or fear, remain away from the Police Station proper. While the officers of the City Mothers' Bureau have police authority, they refrain from using it except when absolutely necessary. They try through love, sympathy, encouragement, and personal interest to teach children their duty to parents and to society, and by this same method to awaken parents to their duty and responsibility.

The City Mothers have found that, by gaining the confidence and holding the interest of boys and girls until they have reached the age of discretion, they usually become good citizens. By this method many very serious cases are uncovered which probably never would have been brought to the attention of the Police Department.

Many parents seem to be asleep to the dangers which surround their children. Dangers have multiplied a hundred-fold in the last twenty-five years, owing to the fact that the parents are employed largely outside the home. The multiplied means of easy communication, swift travel and diversified

amusements constitute nothing less than menaces to morality.

It has been found that the lack of understanding between the parent and the child is often responsible for children's becoming indifferent to obedience—and disobedience as a rule is the first step to delinquency. There are other cases where the children have gotten beyond the control of the parents before they realize it, and not infrequently have gone astray. Then the distracted parents in desperation reach out for aid, and it is here the City Mothers extend a helping hand and assist in bringing the strayed ones back into the fold.

Another great cause of delinquency is the broken and unprotected home. Recently the City Mothers had occasion to make an investigation and they found the children of an entire community demoralized by a family of children whose parents were employed during the day. This home became the rendezvous of all the children in the neighborhood.

The work of the City Mothers' Bureau is largely preventive, forestalling crime, thereby saving the city annually many hundreds of dollars, besides preserving that which is of far greater value—the morals of our girls and boys. A large number of the cases are reported direct from the schools.

This Bureau has been quite successful as a "Domestic Relations Court," bringing together parents who, by their estrangement, had broken up their homes and placed an additional burden on the community. In cases of failure to provide, a technicality sometimes prevents prosecution, and we are often able to secure the desired results without going into court, frequently bringing about a reconciliation of the parents and reuniting broken homes.

The City Mothers have established a day nursery where working mothers may leave their babies for the small sum of ten cents

per day. There are four trained nurses in charge of this nursery and here an average of fifty children are cared for daily.

The City Mother has two assistants and an advisory board of ten representative women, who have helped to create a fund with which to carry on the work of this Bureau, as there is no appropriation from the city other than the salaries of the office force.

Owing to the growth of the Bureau and the numerous outside interests involved, a legal adviser was appointed by the Mayor over a year ago.

MRS. ALETHA GILBERT,
City Mother.

Recreation Departments

Where Those Who Work Can Play

NEWPORT, R. I.—One of the most difficult things in the world is to maintain a proper balance between work and play—to enable work and play to be seen in their right relation to each other.

Living, as we do, in the age of machinery and specialized industry, there is little opportunity for seeing adults, especially men, at productive work. The boys see their fathers around home, smoking, reading, or loafing, rather than at work in store or factory. When father comes home, growling about the job, the impression that work is something to be avoided as much as possible becomes fixed in the adolescent mind.

A recreation system where everything to

play with is furnished gratis for the asking tends to deepen this impression. Play can best be appreciated when it follows work. A system of recreation will render a great service to its city if, in some way, it can fix in the minds of the boys and girls that only those who work can play, and that no one deserves to play, or can play, unless he works. People come to Newport to play, not to work; therefore, it is especially difficult in this city to glorify work and to impress upon the youthful mind that work is a good thing, and to correlate work and play.

There is much work to be done in the care and maintenance of a playground and ball park, and much of this work can be done by children. Of course, it is a very wonderful idea that they should do it from civic spirit, but after a children's crusade against caterpillars which saved the city's trees and saved the city an immense amount of money, no adequate reward had been received by the children in the form of greatly increased recreation facilities, so that it appeared to the writer that work and play should be harnessed up a little more closely.

A work ticket was printed, which says in large letters, "Those Who Work Can Play—5 cents," and in small letters, "This can be exchanged for athletic supplies at any sporting goods store in Newport when properly stamped." Those who do work about the playgrounds are paid by means of these tickets as much as it would cost to have the work done by men. We furnish very few athletic supplies, but furnish the opportunity for every team to work and purchase whatever supplies it needs. The plan is resulting very satisfactorily. The continual sight of this motto, "Those who work can play," cannot fail to impress the

idea upon the minds of the children. The tickets are all numbered, and a record is kept of the numbers given out to the director of each playground, together with detailed instructions for their disbursement.

It is suggested that a boy or a girl under 10 ought to be worth from 5 to 10 cents per hour, and a boy or a girl from 10 to 14 should be worth



A POSTER USED IN THE NEWPORT, R. I., CHILDREN'S CAMPAIGN AGAINST INSECT PESTS

from 10 to 20 cents an hour, according to his ability. A boy or a girl from 15 to 17 should be worth from 20 to 25 cents an hour, and boys and girls over 17 ought to be worth from 30 to 40 cents an hour, according to ability and application. The director of each playground is to see that he gets his money's worth for tickets issued, and that there is no loafing on the job; he must also be able to explain to the Superintendent of Recreation what was accomplished for the tickets given out. These tickets can be exchanged for athletic supplies at any sporting goods store in Newport, or they will be exchanged, at cost, at the Recreation Office for any supplies in stock.

ARTHUR LELAND,
Recreation Consultant;
Superintendent of Recreation.

quaint the rank and file of the citizens with the social, economic and scenic resources of the community. It was sponsored by the Director of the City Department of Public Welfare, the Commercial Association, and the University Extension Division. Many other agencies and organizations cooperated.

The exhibit was held in a large hall centrally located. Thirty portable canvas booths were furnished by the University Extension Division and were arranged on the one-way plan, so that all visitors entered at one door and passed all the booths before reaching the exit. A brief description of some of the principal sections of the exhibit may be of interest:

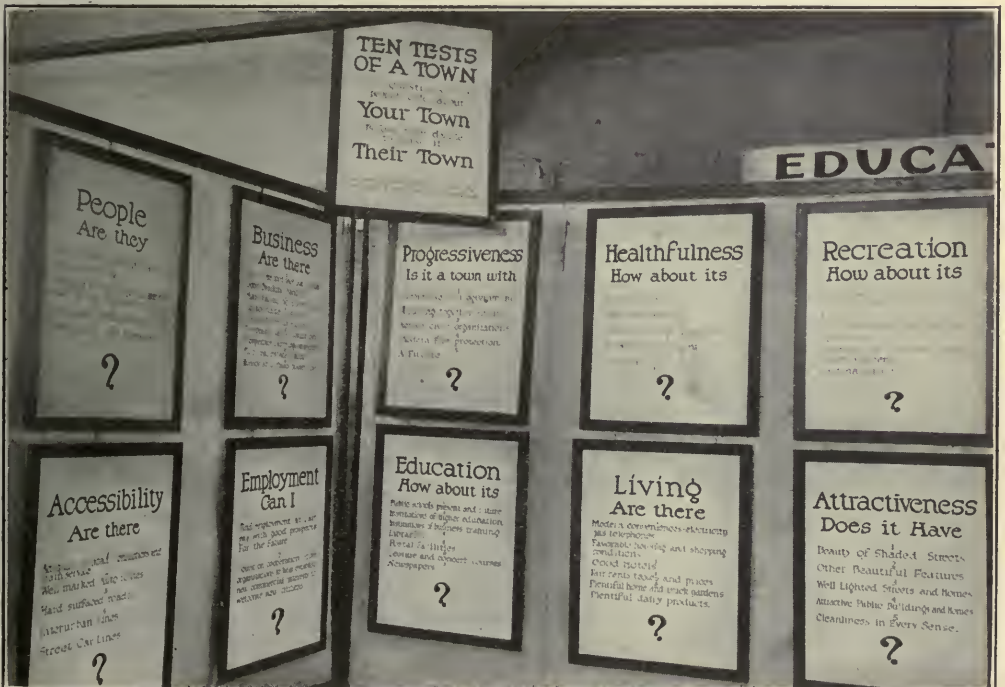
1. The Pioneer Section, consisting of exhibits prepared by pioneers of this community and comprising such things as a model of the first schoolhouse built in Boulder; the first melody; the first chair, and many other items that were the first of their kinds brought to the community. These pioneer exhibits were intensely interesting, not only to the older folks, but also to the younger ones.

2. The Photographic Section, comprising five booths showing exclusively scenic pictures of Boulder and Boulder County.

Public Welfare Departments

Introducing the Community to the Citizens

BOULDER, COLO.—Know Your Community Week was recently held in Boulder to ac-



THESE TESTS WERE APPLIED TO BOULDER, COLO. THEY SUM UP THE ESSENTIAL QUESTIONS ASKED ABOUT ANY TOWN

3. The Public Health Section, dealing with the milk, water and food supplies, as well as giving an analysis of the vital statistics of the community. The data for the vital statistics and some of the other subjects were secured from a social survey just completed by the University Extension Division and the American Red Cross.

4. The Recreation Section, containing among other things a miniature playground illustrative of the type of playground that any community could and should have. This playground had exactly 100 dolls on it. Many of the pieces of apparatus, such as the giant stride, slide, swings, teeters, etc., were operated mechanically.

5. The Education Section, in which the public schools displayed samples of sewing, cooking and manual art work. Many of the visitors had had but little conception of these phases of public school work.

The most convincing evidence of the interest shown in the exhibit is the record of the attendance, which was as follows: first day, 1,187; second day, 1,559; third day, 1,845; fourth day, 3,030; making a total of 7,621 in a community whose population is approximately 11,000.

Meetings so arranged as not to conflict with the exhibit hours were held in the afternoons and evenings. At many of these, illustrated talks were given.

The services of practically all in connection with the exhibit and meetings were given free, but what little expense was necessarily incurred was borne largely by the City Department of Public Welfare.

CHARLES I. MADISON,

University Extension Division, University of Colorado.



A SANITARY COMFORT STATION, LIKE THE ONE AT PUEBLO, COLO., IS THE FIRST REQUISITE OF A GOOD AUTO CAMP

Park Departments

A Municipal Auto Camp at the Gateway of a National Playground

PUEBLO, COLO.—This city is admirably located to attract the tourist. The Santa Fé Trail passes through it, and it has four other surfaced roadways leading to various other cities, towns and summer resorts in the mountains.

The municipal auto camping ground is located just far enough from the business district to afford it some privacy, and still near enough for the purchase of gasoline, oil, tires, spare parts, groceries and other necessities for the motorists. In the camp is a large, sheltered community stove, for which fuel is furnished free, and also a sanitary building, completely equipped. Abundant water is supplied by the hydrants. No charge of any kind is made to tourists. In the near future it is planned to erect a building and equip it with shower-baths and facilities for washing clothes.

Colorado has the San Isabel National Forest, with its wonderful attractions of climate, mountain scenery, roads and fishing. The forest covers practically the entire mountain range within the state and has many creeks, rivers, lakes, waterfalls and other natural scenic features. A road system is planned to cover the entire area and connect it with state and county highways, making it possible to visit practically every city and town in the state and enjoy the mountain scenery on the way. Much of this roadway is completed and more is under construction.

It is planned to provide means by which ground in the National Forest may be leased from the Government for sites for summer homes. The building of community houses and shelter houses is among other improvements started under the direction of the U. S. Forest Service.

E. E. COLBY,
Superintendent of Parks.

Health Departments

The Work of a Municipal Flycatcher

RIVERSIDE, CALIF.—This city will soon be known as "The Flyless City" if its Municipal Flycatcher continues with his scientific fighting of this pest with trap and spray. Last year E. S. Beebe kept 150 traps, well baited with old bananas, melons, milk, and occasionally old meat, at important centers, collecting in his daily tour of inspection millions of flies. This year he is adding to the trap campaign a daily visit to garbage cans, stables, dairies and such gathering places of these obnoxious pests, where with a spraying machine he dispatches countless hordes. His methods should be of interest to every city.

Mr. Beebe, in behalf of Riverside's Board of Health, uses three sizes of traps, the middle-sized one being the most popular. This is simply a wire cage three feet long by one foot square, raised from the ground about one inch. The bottom is made of wire in the form of a V, with holes in the top of the V through which the flies easily crawl into the trap. All food is placed on the ground or on a board outside, but directly under, the trap; thus the traps are always clean. All traps are placed on the ground, for flies prefer to feed on the ground. After eating, they naturally fly upward into the trap. Mr. Beebe, acting on the fact that flies are much like humans in some ways, places the traps in the shade on hot days and in the sun on cold days. Often requests for traps come to him from garage owners, restaurant keepers, butcher-shop or fruit-stand proprietors, who willingly take care of them and thus extend the scope of the Municipal Flycatcher.

For spraying he uses an ordinary tree sprayer, and the mixture consists of one part creosote to six parts distillate of coal oil. Flies breathe through their bodies, and this mixture kills them instantly. One illustration shows Mr. Beebe spraying a garbage can in an alley. All alleys are systematically visited during the feeding hours, which are early morning and evening. Boxes of refuse, manure piles, oil stations,



A MUNICIPAL FLY-TRAP

are also visited daily. Millions of flies are thus destroyed every day during the breeding season. Though the Public Health Board began its fight for a flyless city only last summer, there is a most noticeable diminution of flies in the streets, places of business and private homes.

W. B. WELLS, M. D.,
Health Officer.



ETERNAL VIGILANCE IS THE PRICE OF
FLYLESSNESS

Street Cleaning in California

Suiting the Method of Treatment to Street Mileage and Surface

A SURVEY of the street cleaning methods of eighteen California communities shows that while some flushing is done, the pick-up type of sweeper is the principal piece of motor-driven apparatus used. More than half of these communities have not yet made use of motor-propelled street cleaning apparatus. White wings still predominate as a means of cleaning pavements.

The following statistics were furnished by municipal officials in the various cities mentioned:

Alhambra has 55 miles of paved streets, chiefly oiled macadam, averaging 30 feet in width. For cleaning, 5 white wings are employed and 1 horse-drawn sweeper.

Anaheim, with 8 miles of 42-foot sheet asphalt, employs 2 white wings for gutter cleaning and 1 Elgin sweeper and 1 motor-driven flusher to keep its broad avenues in good condition.

Berkeley, with 20 miles of paved streets, and 160 miles of oiled macadam on asphaltic concrete base with an average width of 36 feet, employs 40 white wings and 1 Elgin sweeper to cover the entire city.

Chico, with only 5 miles of asphalt surfacing on a concrete base, and with streets averaging 70 feet in width, employs 3 horse-drawn sprinklers and 1 horse-drawn flusher.

Corona, having 35 miles of 30- to 80-foot width macadam, has 2 white wings, 2 horse-drawn sprinklers, 1 horse-drawn sweeper, and 1 motor-sweeper to maintain its pavements in a cleanly condition.

Colton, with only 3 miles of paved 54-foot cement concrete road, cleans its streets solely by hand and employs 1 horse-drawn sprinkler to keep down the dust.

Eureka, with 8 miles of bituminous pavements from 36 to 51 feet in width, has 1 motor-driven flusher.

Modesto, with 19 miles of asphaltic concrete roads of 40-foot width, relies chiefly

on flushing and 3 white wings, 3 horse-drawn sprinklers, and 1 horse-drawn flusher.

Oxnard, with 9 miles of Warrenite paving 80 feet wide, employs from 4 to 8 white wings, 2 horse-drawn sprinklers, and 1 horse-drawn sweeper.

Redding has 40 miles of 56-foot asphaltic concrete roads and relies solely on its motor-sweeper for handling the street cleaning problem.

San Diego has 80 miles of 80-foot concrete road, which is kept clean by 12 white wings and 1 Elgin pick-up sweeper.

Santa Barbara has 45 miles of 60-foot asphalt paving on a concrete base and uses 8 white wings, 2 motor sprinklers and 2 machine sweepers which are drawn by Fordson tractors.

Santa Monica.—The 20 miles of asphaltic concrete paving averages 52 feet in width and is cleaned by 6 white wings.

Santa Maria has 4 miles of macadam and concrete streets, averaging 88 feet in width, and uses 1 horse-drawn sprinkler and 1 horse-drawn sweeper.

San José, having 30 miles of asphalt paving averaging 50 feet in width, employs 20 white wings, 2 horse-drawn sweepers, and 1 horse-drawn flusher.

Stockton, with 130 miles of asphalt pavement, averaging 60 to 80 feet in width, maintains 80 white wings, 10 horse-drawn sprinklers, 2 horse-drawn sweepers and 4 horse-drawn flushers, motor-driven apparatus being entirely absent.

San Bernardino has 30 miles of concrete and Warrenite paving, averaging 48½ feet in width. The street cleaning force consists of 3 white wings, 3 horse-drawn sprinklers, 1 horse-drawn sweeper and 1 horse-drawn flusher.

Vallejo, with 25 miles of asphalt paving on a concrete base, averaging 32 to 40 feet in width, has 5 white wings and 1 Elgin pick-up sweeper.

A Glance Ahead

The matter of sewage disposal is one of the most important ones in connection with the maintenance of public sanitary conditions at every summer resort. Unfortunately, in a great number of instances the reputation of particular localities has been ruined by the serious results that have followed lack of education concerning this important detail in modern sanitation.—*Public Health*, State Department of Health, Lansing, Mich.

Sewage Disposal by Fine Screening at Bridgeport, Conn.

Installation of Riensch-Wurl Screens Prepares Sewage for Ultimate Disposal by Dilution

A VISIT to the sewage treatment plant located on the southwest edge of the well-populated district in Bridgeport, Conn., impresses the engineer with the thorough attention given to detail, the excellence of the concrete work, and the value of this method of treatment as applied to Bridgeport conditions.

The flow line of the interceptor at the plant is at elevation 100, or 22 feet below the street level and 10 feet below mean low water. In the original studies, several combinations of screens and pumps were considered, including the plan of having the high-level screens following the pumps, so that the screened effluent would flow by gravity to the outfall. This scheme would have saved something on the cost of construction of the station, but it was discarded mainly because the screens would be more effective if installed ahead of the pumps.

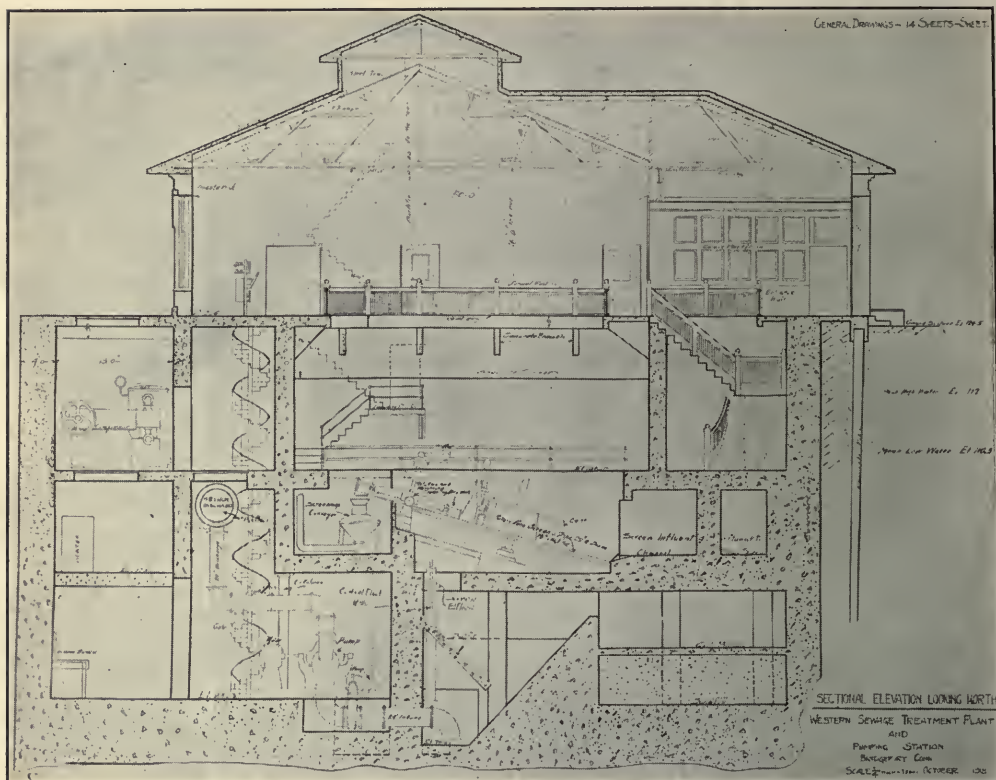
In the plant as finally decided upon and installed, the sewage from the 71-inch interceptor flows through the sluice-gate to a

bar screen at elevation 100, and thence through a concrete channel to the Riensch-Wurl screens. The screened effluent flows over an adjustable weir to the sump at elevation 80, and is then lifted by the pumps to the force main at elevation 105.

The plant is designed for three Riensch-Wurl screens to handle a total dry-weather flow of 35,000,000 gallons per day. The estimated population of the district when fully developed is 180,000. As the present population of the district is in the neighborhood of 100,000, two screens have been installed and a third will be when needed. Each screen consists of a circular disk 22 feet in diameter and inclined to an angle of 15 degrees from the horizontal. A truncated cone 12 feet in diameter at the base is centrally mounted on the disc. The surface of both disc and cone consists of a number of removable bronze plates perforated with slots 2 inches long and 3/64-inch wide. The lowest point of the disc is set at the elevation of the influent, and the slope is such



A CONSTRUCTION VIEW, SHOWING METHOD OF POURING CONCRETE FOR CIRCULAR FOUNDATION



SECTIONAL VIEW OF BRIDGEPORT SEWAGE SCREENING PLANT

that about one-third of the disc is above the surface of the water.

The sewage flows onto the screen, which is revolving at the rate of about one revolution in two minutes. The liquid passes through the perforations on the disc and flows over the weir into the pump sump. The suspended solids which are retained on the screen are lifted out of the water as the screen revolves and are brushed off the screen into the hopper of the screening conveyor system. The brushes are cylindrical and are carried on a revolving spider, which is mounted on a shaft parallel with the main disc shaft. These brushes work on the same principle as a street sweeper, which is carried along the street mounted on a truck and at the same time is revolving and brushing the refuse ahead of it.

The screenings are conveyed from the hopper to the storage tanks by a pneumatic system, which does away with the necessity of handling it in open cans on an open conveyor belt. From the storage tank, which is located 10 feet above the street level, the screenings are dropped into tank

wagons, carted to the town farm and buried.

The pumping equipment of the station consists of two 20-inch horizontal centrifugal pumps, each having a capacity of 15,000,000 gallons per day, and two 15-inch horizontal centrifugal pumps with a capacity of 8,000,000 gallons per day each. These pumps are direct-connected to electric motors controlled by floats in the pump sump. The floats are adjustable and electrically connected to switches and automatic motor starters, mounted on panels of the main switchboard. A Venturi tube is installed on the outfall, with the record chart and register located on one of the main switchboard panels. The 60-inch gate-valve, electrically operated, is installed in a gate-house at the discharge end of the Venturi tube. The building contains a complete system for heating, ventilating and plumbing, including toilets and shower-baths.

Method of Construction of Plant

The original plans for the plant itself were approved by the State Board of Health, and construction started about the first of

1919. The substructure is a reinforced concrete caisson, 80 feet inside diameter and 45 feet deep. The cylindrical shell forming the outside wall is constructed of a series of rings 10 feet high. The rings were cast above ground, and after the concrete in each ring was properly set, the forms were removed and the ring sunk until the top was approximately a foot above the ground. The forms were then reassembled and the next section cast. When the caisson had reached the predetermined depth, the bottom was placed under water. After the concrete bottom was set, the caisson was unwatered, and the bottom made smooth and finished to a surface. Following this, the inside walls, partitions, beams and floor slabs were built. The rectangular superstructure is of tapestry brick with stone trimmings and a red tile roof.

The lowest ring, which contains 475 cubic yards of 1-2-4 concrete and 30 tons of steel, was completed in March, 1919. After a few days the forms were removed and set for the second ring. The same forms were used for all five rings. The second, third and fourth rings, each containing 500 cubic yards of concrete and 16 tons of steel, were finished by June 1, the concrete being poured in continuous operations of about 8 hours for each ring.

After the first ring had been poured and the forms removed, the ring was allowed to sink by excavating the material from the interior. Two $\frac{3}{4}$ -yard clam-shell buckets and two 65-foot boom stiff-leg derricks, set up on opposite sides of the caisson, averaged about 200 cubic yards of excavation a day. One derrick was placed on the north side of the caisson, the other on the south.

On the east side toward Bostwick Avenue were two one-yard mixers and an 80-foot double hoisting tower, from which the concrete could be delivered through chutes to any part of the ring. Just north of the tower was another derrick which supplied sand and gravel to hoppers located above the mixers. As the excavation proceeded, levels were taken at frequent intervals each day on the top of the shell, and if one side was found to be sinking too fast, excavation was stopped on that side and continued near the other side until the ring was level again. At no time was the caisson more than 9 inches out of level.

In the completed structure the absence of unnecessary holes in the concrete partitions and of places where concrete had been chipped out after the forms were removed, and of other such unsightly jobs, shows the care given to the design of the complete structure and to the excellence of the work by the contractor. It is seldom that a piece of work of this type can go through from beginning to end without a considerable number of changes in design which show in patchy work when the whole structure is completed.

George W. Fuller and George A. Johnson, New York City, were the associated consulting engineers for this work. The general contractor was the Eastern Engineering and Construction Company, Bridgeport, Conn. The sewage treatment apparatus and mechanical equipment was furnished and installed by the Sanitation Corporation, New York City, and the plant is now operated by the Department of Public Works, of which J. A. Courtade is Director.

On the Calendar of Conventions

MARCH 22-23.—INDIANAPOLIS, IND.
Indiana Sanitary and Water Supply Association. Annual meeting. Secretary, C. K. Calvert, 1902 North New Jersey Street, Indianapolis, Ind.

APRIL 19-21.—SPARTANBURG, S. C.
Tri-State Water and Light Association of the Carolinas and Georgia. Annual meeting. Secretary, W. F. Steglitz, Columbia, S. C.

MAY 1-4.—NASHVILLE, TENN.
Southern Commercial Secretaries Association. Annual convention. Secretary, Roger Miller, Chamber of Commerce, Macon, Ga.

MAY 9-11.—ATLANTIC CITY, N. J.
National Fire Protection Association. Annual meeting. Secretary, Franklin H. Wentworth, 87 Milk Street, Boston, Mass.

MAY 15-19.—PHILADELPHIA, PA.
American Water Works Association. Annual convention. Secretary, J. M. Diven, 153 West 171st Street, New York, N. Y.

MAY 15-19.—ATLANTIC CITY, N. J.
National Electric Light Association. Annual con-

vention. Executive Manager, M. H. Aylesworth, 29 West 39th Street, New York, N. Y.

MAY 15-21.—WASHINGTON, D. C.
Chamber of Commerce of the United States. Annual meeting. Secretary, D. A. Skinner, Mills Building, Washington, D. C.

JUNE 4-6.—SALT LAKE CITY, UTAH.
American Association of Engineers. Annual convention. Secretary, C. E. Drayer, 63 East Adams Street, Chicago, Ill.

JUNE 13-17.—VICTORIA, B. C.
Canadian Good Roads Association. Annual convention. Secretary, George A. McNamee, 909 New Birks Building, Montreal, Quebec, Canada.

AUGUST 9-18.—SAN FRANCISCO, CALIF.
International Association of Fire Engineers. Annual meeting. Secretary, James J. Mulcahey, City Hall, Yonkers, N. Y.

OCTOBER 9-13.—CLEVELAND, OHIO.
American Society for Municipal Improvements. Annual convention. Secretary, Charles Carroll Brown, P. O. Box 234, Petersburg, Fla.

What Is a Fair Salary for a Fire Chief?

THE accompanying table was prepared from the returns on a questionnaire sent out by THE AMERICAN CITY. In analysing the figures given in a table of this sort great care must be taken to avoid jumping to conclusions. The simple figures of population and dollars cannot state the whole case in regard to a given city. For instance, the cost of living varies widely in different parts of the country, naturally imposing different standards of pay.

The most striking fact to be learned from a table of this sort is the want of standardization of salaries, which was demonstrated by William E. Mosher in the article, "A Fair Wage Versus a Chance Wage" in THE AMERICAN CITY for February. Looking down the table, we note that of two Massachusetts cities of over 50,000, Brockton and Cambridge, it is the smaller city that pays the larger salary. Binghamton, N. Y., Brockton, Mass., and Allentown, Pa., are nearly equal in size, yet the Allentown salary is not much more than half of the Brockton figure, while Binghamton is midway between. Yonkers, N. Y., is little smaller than Cambridge, Mass., yet its salary is \$1,000 greater, and is double that paid in Reading, Pa.* Possibly the character of the industries of these cities accounts for a variation of the size of the department required and the consequent demands on the Chief.

Passing to the cities between 25,000 and 50,000, the table shows a greater amount of uniformity. The largest salary reported is in Lorain, Ohio, \$3,000, the smallest, in Irvington, N. J., \$1,800, though there is a considerable difference in the size of the towns. There is a sharp contrast between Lima, Ohio, and Lorain, Ohio, the cities being nearly of a size.

Among the cities between 10,000 and 25,000, comparisons are more difficult, as such cities vary widely in character: some are largely manufacturing, others mostly residential. The character of the manufacturing carried on might involve great difference of fire hazard, yet in this group there is surprising uniformity of salary. The largest reported salary is that of Corning, N. Y., \$2,040, and the smallest, Fulton,

N. Y., \$780, although these places are of nearly equal population.

Among cities of less than 10,000 there are great contrasts of salary. This is due primarily to the fact that some have volunteer departments, while others have full-time crews. For example, Suffolk, Va., pays \$1,800 a year, and Saranac Lake, N. Y., with a population but little smaller, pays the Chief nothing. In general, throughout this group the salary is nominal, \$100 being a figure frequently met.

The group of places under 5,000 offers the widest discrepancies in salary. Population figures are given for places over 2,000 under the 1920 census, while those for which no population is given have less than that number. In most cases here, the salary is nominal, there being a few notable exceptions. Ocean City, N. J., may be regarded as a peculiar case, owing to its character as a seaside resort, with a fluctuating population. An interesting feature is the salary in Hillsboro, Ohio, \$30 a year, with an allowance of \$2 per call answered. Other exceptions are the allowance in Wheaton, Minn., of \$1 an hour for time actually consumed in fire-fighting, and in Clarkston, Wash., of \$5 per fire.

It is unusual for a city to call to head its department a man who has made a record as fire chief of another city. As a rule, the chief is chosen from the fire department of his city, after years of service. Owing to his specialized profession, there is no free market for his services—the city is not obliged to bid for his service against competitors within itself, as in the case of a city attorney or engineer. From the very nature of his profession, the chief is obliged in many instances, to accept what his city chooses to offer him.

It is impossible to look through the accompanying table and say, "This city pays too much," or "That city pays too little." Special circumstances may control what seem to be the most serious injustices. But the tables do show that some cities are paying less than what may be termed an average salary for cities of their class; and such a statistical tabulation is of value in showing such cities how they stand in comparison with other cities where approximately the same conditions prevail.

* A volunteer department.

SALARIES OF FIRE CHIEFS
 FIGURES STATE ANNUAL SALARY, UNLESS
 OTHERWISE SPECIFIED

State and City	Population	Over 50,000	25-50,000	10-25,000	5-10,000	Under 5,000
IOWA:						
Harlan	2,831					\$37
Marshalltown	15,731			\$130 per mo.		
Tipton	2,142					None
KANSAS:						
Kingman	2,407					\$1
MASSACHUSETTS:						
Brockton	66,254	\$3,500				
Cambridge	109,694	3,000				
Hudson	7,607				\$1,550	
Salem	42,529		\$2,275			
MICHIGAN:						
Battle Creek.....	36,164		2,400			
Grand Rapids....	137,634	3,273.75				
MINNESOTA:						
Albert Lea.....	8,056				\$150	
Benson	2,111					\$50
Wheaton						\$1 per hr.*
MISSOURI:						
Kirksville	7,213				\$75 per mo.	
Marceline	3,760					\$5 per mo.
Warrensburg	4,311					\$100 per mo.
MONTANA:						
Bozeman	6,183				\$152.50	
NEBRASKA:						
Hastings	11,647			\$1,800		
NEW JERSEY:						
Irvington	25,480		\$1,800			
New Brunswick..	32,779		\$2,700			
Ocean City.....						\$112.50 per mo.
Princeton	5,917				\$50	
NEW YORK:						
Auburn	36,192		\$2,400			
Batavia	13,541			\$1,650		
Binghamton	66,800	\$2,760				
Corning	15,820			\$2,040		
E. Syracuse.....	4,106					\$200
Fulton	13,043			\$780		
Granville	3,024					None
Herkimer	10,453			\$1,560		
Jamestown	33,917		\$2,200			
Little Falls.....	13,029			\$1,680		
Middleburg						None
N. Tonawanda....	15,482			\$1,800		
Rochester	295,750	\$4,200				
Saranac Lake....	5,174					None
Saratoga Springs.	13,181			\$2,000		
Watervliet	16,073			\$1,600		
Yonkers	100,176	\$4,000				
Champlain						None
NORTH CAROLINA:						
Spring Hope.....						None
NORTH DAKOTA:						
Casselton						None
OHIO:						
Ada	2,321					\$50
Akron	208,435	\$4,500				\$1,800
Bryan	4,252					None
Covington					\$100	
E. Palestine	5,750					\$50
Hicksville	2,378					\$30**
Hillsboro	4,356		\$2,112			
Lima	41,306		\$3,000			
Lorain	37,295			\$125 per mo.		
Marietta	15,140			\$2,000		
Middletown	23,594				\$100	
Ravenna	7,219					
Tiffin	14,375			\$1,800		
OKLAHOMA:						
Enid	16,576			\$200 per mo.		\$55
Geary						\$115
Stillwater	4,701					
OREGON:						
Baker	7,729				\$150	
Salem	17,679			\$1,800		

* While fighting fires.

** Plus \$2 per call.

SALARIES OF FIRE CHIEFS (Continued)

State and City	Population	Over 50,000	25-50,000	10-25,000	5-10,000	Under 5,000
PENNSYLVANIA:						
Allentown	73,502	\$2,000				
Bellefonte	3,996					None
Bristol	10,273			None		
Brockwayville						None
Brookville	3,272					None
Carbondale	18,640			\$350		
Harrisburg	75,917	\$2,500				
Oil City	21,274			\$1,740		
Philadelphia	1,823,779	\$5,000				
Pottsville	21,876			\$1,500		
Reading	107,784	\$2,000				
Warren	14,256			\$2,100		
York	47,512		\$2,000			
RHODE ISLAND:						
Central Falls....	24,174			\$1,400		
Providence	273,595	\$70 per wk.				
SOUTH DAKOTA:						
Aberdeen	14,537			\$145 per month		
Mitchell	8,478			\$100		
TENNESSEE:						
Jellico	1,875					\$60
VIRGINIA:						
Portsmouth	54,387	\$2,520				
Suffolk	9,123				\$1,800	
VERMONT:						
Rutland	14,954			\$1,550		
WASHINGTON:						
Clarkston						\$5 per fire
Spokane	104,437	\$3,105				
WEST VIRGINIA:						
Bluefield	15,282			\$175 per month		
Martinsburg	12,515			\$1,500		
WISCONSIN:						
Eau Claire	20,380			\$2,400		

Municipal Lodging House Useless Unless Run as "Human Repair Shop"

EXPERIENCE with the municipal lodging-house in New York City during the past four years is a warning to other cities that it is a costly and ineffective institution if operated as a mere shelter, instead of as a "human repair shop" and clearing-house for unemployed and homeless men and women.

This statement is made by Stuart A. Rice, formerly superintendent of the New York Municipal Lodging House, in the *American Labor Legislation Review*.

"Completed in 1909 at a cost of nearly \$400,000, with a 'model' plant and equipment, the institution quickly became known throughout the world and might reasonably have been expected to provoke extensive imitation. The expectation has not been realized. Not to exceed half a dozen American cities have a municipal lodging-house, and even in these, the question of its discontinuance is periodically brought forward."

Failure to distinguish between "unemployable" persons, such as the sick and defective, and the "unemployed," whose only need is a job, is a serious fault of municipal lodging-house administration. Separate treatment

for the two classes is essential. Two distinct problems arise when "a temporary demand for emergency shelter for unemployed men is periodically superimposed upon a continuing demand for the classification and treatment of unemployable men."

Official reports show that the daily per capita cost for each lodger at the New York Municipal Lodging-House during 1918 and 1919 was \$1.50. "One dollar and a half a day," says Mr. Rice, "would be a reasonable per capita expenditure for a 'human repair shop,' such as was visualized by Commissioner John A. Kingsbury in his 1914 report to Mayor Mitchel. But when New York City spends \$1.50 in providing a 30-cent 'flop' to its guests, the absence of imitators among municipalities can readily be explained.

"A 'clearing-house' for homeless men and women—such as a municipal lodging-house should be—would make a thorough-going effort to understand the ills—physical, mental and social—that afflicted each of its inmates. In brief, its end would be the permanent solution of the human problem with which it is confronted."

A Successful Municipal Abattoir

The Community Value of the Paris, Texas, Abattoir Shows Great Possibilities for These Public Utilities

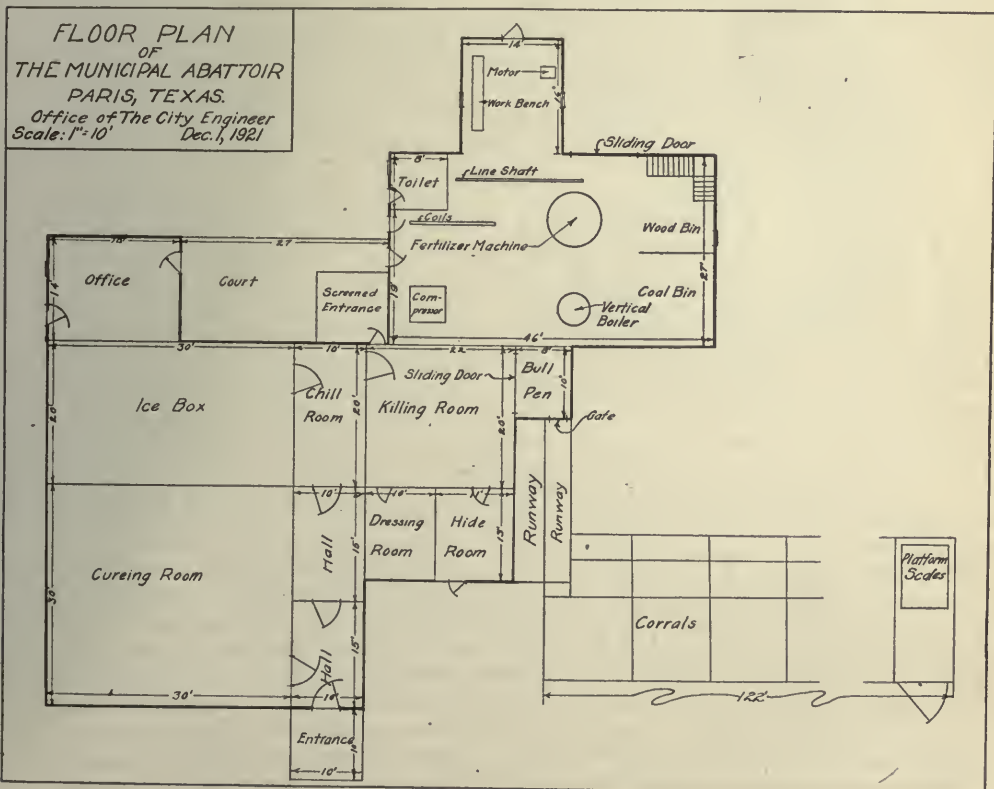
By Cora Lee Moore

Secretary to the Mayor, Paris, Texas

ABOUT 88 per cent of the fresh meat used in Paris, Texas, is slaughtered at the municipal abattoir. The cattle and hogs which are slaughtered are brought in from the surrounding country, and in that way the city furnishes a market for the live stock raised by the small farmer. Without this, the farmer in selling or disposing of his live stock would have to pay for freight and not receive any more per pound after shipping to outside buyers. The abattoir not only provides a market for animals but also enables the people of Paris to obtain a first-class quality of meat at a price considerably lower than could be obtained if this meat had to be imported from the packing-houses.

At the abattoir the most scrupulous sanitation is observed, as well as careful screening and good ventilation. Hogs are brought in from the yard, killed, scalded, scraped, properly cut up and dressed; the carcasses are placed in the cooler and remain there for 12 hours, at 40 degrees Fahrenheit. At the end of this period, following the usual order of things, they are placed in the "big box," a refrigerating room kept at a temperature ranging from 32 to 36 degrees. Four days' free storage is allowed each customer, the charges being as follows:

City Meat Markets.—Beeves, \$2.50 each; hogs and calves, \$1.50 each; sheep and goats, \$1.00 each, including inspection. Ten cents per day is charged after four days.



Private killings.—Beeves, \$2.50 each; hogs and calves, \$1.50 each; sheep and goats, \$1.00 each, including inspection. Hogs when cut up and salted down, \$2.50 each. Five cents per day storage after the first four days. Salt is furnished by the city.

It is a rule that everything brought to the Paris abattoir must be brought alive, to enable the expert veterinarian employed by the city to make the inspection of animals on the hoof, as required. Another inspection of the carcass is made by a second official. No meat may be offered for sale within the corporate limits that does not bear the stamp of the city inspector. This applies even to all shipments of meat or fish that may be brought in by rail from packers or others. In this way the health of the public is protected from tuberculosis and other diseases, and the best quality of meat is insured. A salary of \$100 a month is paid the veterinarian for his services of inspection, which occupy only a portion of his time.

Besides the veterinarian, the force employed at the Paris abattoir consists of a bookkeeper who looks after the general management of the plant, collecting, etc., an engineer for the refrigerating machinery, and three butchers or skinners, one of whom makes deliveries to the retail butchers in the city.

The Plant Incinerator

Animals that are rejected by the veterinary are consumed in the huge incinerator operated in connection with the abattoir. It is often necessary for an attendant to stand by to restrain negroes from snatching part of the condemned meat from the flames. The incinerator serves other useful purposes. All combustible trash, city garbage, dead dogs, cats, chickens, and waste of every description is hauled by the city free of charge and destroyed in the large burners. The incinerator is so arranged that no other fuel is required than the trash gathered from the city. This entirely eliminates the unsightly paper and trash dumps so commonly seen around towns and cities that would otherwise be beautiful. The incinerator is never without a useful job to do.

The Curing Plant

A curing plant is run in connection with the abattoir. This addition cost approx-

imately \$5,000 and was made to meet the urgent need of farmers who desired to be able to kill hogs at any time during the year. This curing plant, maintained at a temperature of 40 degrees, is fully equipped in accordance with modern practice, and each customer has his own bin, upon which he may place a padlock if he so desires. His name and tag are on the box. He calls and checks out his meat whenever he chooses; or if he so desires, he may check out any portion of the meat, leaving the remainder in cold storage. Any citizen of the town or surrounding country can have his meat slaughtered and stored here any day during the year, and the farmers particularly are taking advantage of this service, so that this part of the plant is generally well filled.

The whole plant is housed in a one-story wooden building and cost when constructed about \$10,000. Some parts of the equipment, however, have been replaced.

The Paris abattoir made its errors, but persistence and careful management have placed it on a paying basis. For several years, at the start, the abattoir failed to pay. It was discovered that its volume of business did not justify the operation of the fertilizer plant which had been installed. Also, it soon became apparent that the charges were too low, and when they were raised to a point where they would make an adequate return, there were no complaints from the customers. Quite a number of minor changes, all tending toward the betterment of the abattoir, both materially and financially, took place in the first year of operation. Each year finds room for improvement, adding here and there more modern equipment, etc. The last few years have been very profitable ones for the plant. In 1919 the cost of operation was \$9,514.56, which included \$2,000 for remodeling. The receipts amounted to \$10,730.54, and in 1920 the receipts exceeded \$12,000.

Hog Raising

A unique but nevertheless profitable feature is the raising of hogs on the offal of the plant. Their feed consists only of the clean waste from the beeves slaughtered by the city, and some corn. Sales are made in small lots usually. In the latter part of 1919, however, one retail butcher bought hogs from the city for which he paid

879.45; a few months later another sale was made amounting to \$654.90; another in 1920, \$1,215, and still another for \$290. This is practically clear money, as there is very little expense attached to this department. In the last few months the market has fallen off considerably and there are very few sales made from the abattoir pens. There are on hand at present about 37 hogs weighing from 250 to 350 pounds, and 107 ranging from 100 to 175 pounds.

After twelve years of trial, the Paris abattoir is giving genuine satisfaction to the city and the surrounding territory, and it is believed that the community would not do without this advantage to the general welfare through the output of clean, whole-

some and sanitary meats. The plant is claimed to be the first of its kind in the United States and should serve as a basis on which every town and city with a population of 5,000 or more can base a like institution, especially where there is a chance of giving a market to the small producer and of improving the quality and lowering the price of meats to the consumer. It is hoped within a few years to build a brick structure which will have a more commodious cooling room, refrigerating room and curing plant, and perhaps a smoke-house and other new features. The cost of a new plant would mean a far greater expenditure than the present successfully operating abattoir represents.

New Street Signs in San Francisco

Definite Replacement Program Will Give Entire City These New Signs in a Few Years

THE long-heralded and urgently needed new street signs to guide the stranger and assure the native of his destination have appeared in San Francisco. Convenient and understandable street signs in San Francisco have been a matter that has been agitated by civic organizations and automobile clubs for a long time, and when all the signs are installed it is expected that the streets of this city will be marked as conveniently and thoroughly as those of any metropolis in the country.

In the past the signs have been placed at various elevations and upon different types of supports, including telegraph poles, lamp-posts and buildings. The result has been far from satisfactory, and the appropriations made for this work have not resulted in a standardized system of any pronounced effect.

The new sign, made by the California Metal Enameling Company, Los Angeles, is of the criss-cross type and consists of four porcelain plates 5 inches by 22 inches with 3-inch letters mounted in a channel iron frame $\frac{1}{2}$ -inch by 1 inch. The complete frames and plates are in turn mounted on a 3-inch standard pipe support measuring 9 feet from the ground to the bottom of the lower sign. The letters are of white on a background of dark blue. One standard complete with signs erected cost \$18.



TYPE OF NEW SIGNS IN SAN FRANCISCO

According to the program of City Engineer M. M. O'Shaughnessy, it is the intention to place these signs first in the downtown section of the city, and each year to carry out the work in the other sections until every unit of the city is equipped with proper and conspicuous street signs. The signs in the down-town section will make their first appearance from the Embarcadero to Van Ness Avenue.

The 1921-22 budget provides for an appropriation of \$7,500 for street signs for this fiscal year, and will carry the same allowance each year as long as needed.

The New American Falls, Idaho— A Town Reborn

By Russell VanNest Black

Town Planner

INSTANCES of planning the growth of cities from the beginning are exceedingly rare. Most planning efforts are occupied with the patching of hopelessly jumbled grown cities—not planning, but re-planning. When the rare opportunity comes to build a town from the ground up, it is hailed with delight. The planning for the new American Falls has been just such a pleasing problem.

After the days of the mining booms, men settled back into the fertile valleys. There towns grew upon the firm foundation of agriculture. Irrigation, sheep and cattle raising, dry-farming of wheat, and, later, hydro-electric power, were the largest factors of growth. Wherever railroads tapped these resources, towns sprang into existence.

Such a community is the old American Falls, county-seat of Power County, Idaho. It was founded with the coming of the railroad and lies in the very fertile but arid Snake River Valley at the point where the Oregon Short Line Railroad crosses the river. The original town, now a community of 1,554 people, was built without plan or foresight, partially upon land ill adapted to civic growth.

Moving the City

In developing plans for the utilization of the hydraulic resources of the upper Snake River watershed, it has been found that a maximum development will involve the construction of a dam at American Falls, where topographic conditions render feasible the most efficient control of the stream. This dam will create a reservoir 125 square miles in area, impounding water sufficient to irrigate 300,000 acres of very fertile land. The work is planned to be financed largely by contributions from local interests under the direction of the United States Reclamation Service. Preliminary to undertaking actual construction and in addition to the work outlined in this article, the Reclamation Service has completed diamond drill borings at the proposed dam site and has made extensive surveys and engineering

studies. It is estimated that the cost of the reservoir may exceed \$13,000,000.

More than four-fifths of the old American Falls lies within the area to be submerged. In all, there must be moved or wrecked: 344 residences, 46 business houses, 3 hotels, 2 schools, 5 churches, 1 hospital, 6 grain elevators, 1 flour mill, and numerous shacks and sheds. The railroad, which now passes through the center of the town, also falls for a short distance within the reservoir right of way, and must be moved a maximum distance of 1,600 feet back from its present location.

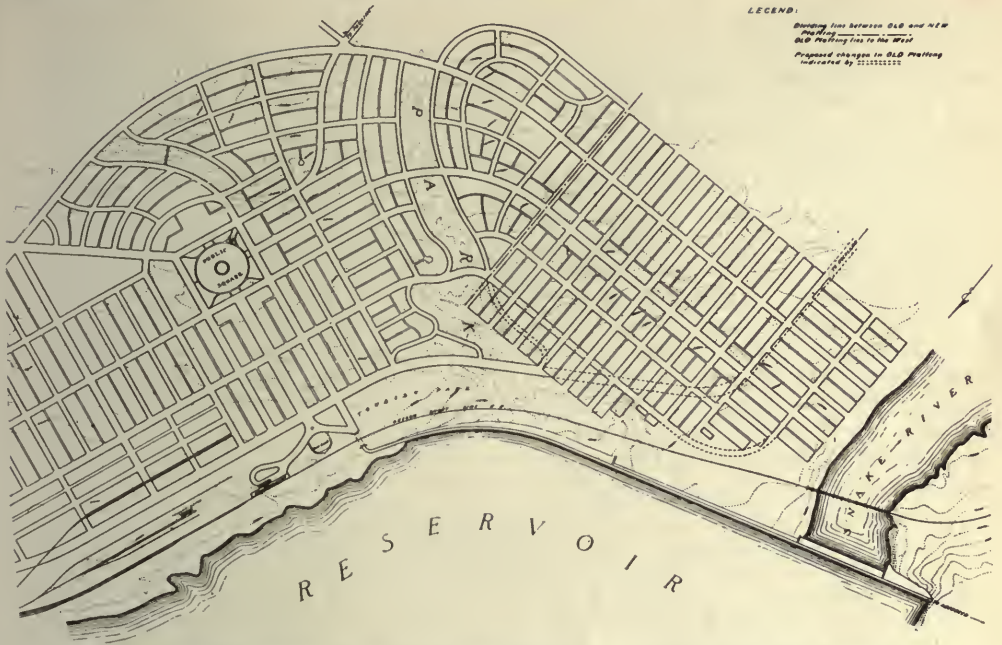
Rather than risk the results of private initiative, the Government has undertaken the relocation of the community. Six hundred acres of virgin land adjacent to a small part of the old town, which need not be greatly disturbed, was purchased as a site, and the writer was engaged to prepare complete plans for the new town.

The new site is on the higher ground, approximately a half-mile east of the old business center. Comparatively level and unbroken except by one or two shallow draws, and sloping gradually from the reservoir back to the low, irregular hills, it is almost ideally adapted to civic development. The only difficult adaptation is an adequate connection with the surviving small, ill-arranged section of the old town.

A chief problem lay in the size of community for which to plan. In the building of cities there is but one thing apt to do greater injury than the neglect to plan and provide for the future, and that is, to promote a city where no power on earth could properly maintain more than a hamlet.

The Town's Probable Future

Thorough investigation has been made of the apparent resources of the district and their probable influence upon the growth and prosperity of the new town. Thousands of acres of undeveloped irrigable land within the zone of influence; vast extent of wheat lands that may be dry-farmed to greater



MAP OF AMERICAN FALLS, IDAHO, SHOWING THE OLD AND THE NEW SECTIONS

It is rare that the town planner can plan for an entirely new city. American Falls, Idaho, must be entirely rebuilt, on account of the needs of reservoir construction. The head of the arrow, at the extreme right, indicates north

advantage; the continued and possibly increased raising of cattle and sheep; unlimited electric power and the possibility of the development of such industries as flour mills and wool-scouring mills in this community, central to so much wheat and wool production; the increasing importance of the town as county-seat; the reservoir as an engineering accomplishment of broad interest, and possibly as something of a pleasure resort, attracting visitors from far and near; and the thousands of workers to be brought in during construction of the dam, some of whom will inevitably remain—all point to a bright future for the community. Leaving out of consideration the not improbable discovery of some undeveloped natural resource, it is not difficult to see the ultimate town grown to a thriving community of not less than 10,000 people.

This possible population has been assumed as a basis for the plan, which, however, is of an expansive nature, comfortable for the few as well as for the many. If for any unforeseen reason the city does not grow, it will be comfortably accommodated near the center of the new site. If it needs to expand, land and streets are provided to permit of development along the most logical lines at a minimum of inconvenience.

Determining Factors

The general character of the street system is largely determined by the location of the railroad, fixed by grade, the reservoir on the west, and the low, irregular hills on the east. Other factors are the surviving section of the old town and the highways entering from the surrounding country. The three chief highways are: from Pocatello, the nearest considerable community, 30 miles to the north; from Rockland and the dry-farming districts to the south; and from the territory across the river to the west.

The hills and reservoir have forced a plan somewhat elongated northeast and southwest. This happens also to be the general direction of the heaviest traffic flow, up and down the valley, and is the most logical trend of growth. Each of the main highways is brought into town with consideration of its greatest use, and is distributed as directly as possible to the various centers—residential, business, industrial, and social. Effort has been made to lead these highways into, rather than through, the community, necessitating that every traveler obtain at least a glimpse into the heart of the town.

The location of the railroad has been a large factor in laying the first foundations. To obtain suitable grade, it is necessary that

the railroad skirt the reservoir. Since this eliminates the possibility of its ever cutting through the community, and since for the greater distance through the town it passes unobtrusively through a deep cut, this location is not undesirable.

Approaching from the west, the railroad enters upon a heavy grade which places the westernmost practical location for the passenger depot approximately as indicated on the plan. It is desirable that the business center of the community be located in some convenient relation to the depot. Coincidentally, the area directly east of the proposed depot location, being comparatively level and centrally located, is well adapted to development as the business and social center.

The Various Sections of the Town

A broad avenue, designed as the chief retail business street, is carried from the railroad and reservoir back some 1,400 feet to a large public square, terminating in the court house beyond. This public square is planned to become the recreation center of the community, and sites have been reserved on its four sides for the various public and semi-public buildings, including: the court house, Federal building, recreation hall, churches, hotel, and theater.

In the northwest section of the site, adjacent to the railroad and the freight depot and to the leeward of the rest of the community, an adequate tract has been reserved for storage warehouses, grain elevators, loading-pens, heavy business, and whatever mills or industries may desire accommodation. Blocks in this district have been turned in a contrary direction, to make them more accessible to spur tracks and to afford somewhat of separation from the second-class residential district located on the level, fertile land directly east of and accessible to the industrial district and readily adaptable to the economical development of homes and gardens.

South and southeast of the public square and separated from the second-class area by a large combined school and playground, is the first-class residential district. This largely occupies the first level of low, irregular hills, more adapted to the better class of development.

Complete restrictions defining the various are to be placed in the land con-

tracts until such time as a zoning ordinance, based upon these restrictions, can be put into effect. First- and second-class residential districts are to be differentiated by construction only. The retail business district, including the broad avenue mentioned above and the flanking streets on either side, has also been divided into first and second classes, the differentiation being based upon construction and use. The section of the old town to be retained, not being the property of the United States, must remain unrestricted until a zoning ordinance is obtained, but it is of a character unlikely to be of appreciable influence upon the remaining development.

The Streets

The average lot size in the second-class residential district is 60 x 135 feet, and is but slightly larger in the better-class district, comparative size throughout being based upon adaptability to use. Business lots average 25 x 125 feet, and the industrial area is divided into 50-foot frontages for convenience of sale.

Street widths vary from 50 feet for minor residential streets to 80, 90 and 100 feet for the main traffic leads, and 120 feet for the short business street. All streets, in cross-section, have been arranged upon an elastic plan, with trees set to permit pavement widening as need demands. To obtain desired openness and space between houses, set-back lines varying from 15 to 30 feet are established throughout the residential districts. All streets have been arranged with a feeling for topography, to the end that there are no excessive grades or side-hill cuts.

Because the district is accustomed to their orderly use and is not of a type in which they are likely to become dangerous, public alleys have been used throughout. They are to carry the electric light and telephone poles and other public utilities, including sewer and water.

Water will be obtained from wells driven in the higher ground east of the city. This source failing, large flowing springs on the west bank of the river will provide a bounteous supply.

Because of the low rainfall, about 15 inches, the surface run-off can be cared for without any great extent of storm-water sewer. Sanitary sewage will be treated in septic tanks.

Provision for Parks and Playgrounds

Adequate areas are reserved in the plan for parks and playgrounds. The public square is to become a restful area of cool shade and greensward, furnished with a band-stand, a bit of splashing water and a wading pool for the youngsters. It is to be, in every sense, the recreation center of the community.

A shallow draw, a stream-bed dry during most of the year, extends through the southerly portion of the new site from the railroad to the hills. This draw is ill adapted to residential use. It is to be developed as a naturalistic park with flanking park-like streets and walks, and planted to a few of the more hardy local native evergreens and shrubs. In this mecca of the automobile tourist it has become incumbent upon all communities to provide tourists' camping parks. An area between the main highway from the south and the railroad is well adapted to this use and has been reserved for that purpose.

This is the present extent of park land, with the exception that it has been recom-

mended that, as the community grows, attention be given to the preservation and development of the reservoir shore and river bank.

Two new school sites have been reserved, each with area adequate for playgrounds to serve the whole community.

Trees have been recommended for all streets, including those of the business district. The poplar is the favorite tree in most parts of the Snake River Valley. However, experimental planting has proved that the better trees, such as oak, elm and linden, if given water, will thrive even more vigorously here than in the East. The better trees have been recommended throughout the entire community.

To insure the comfort of the present small town in the full-grown plan and to provide that the community shall be conveniently and economically condensed throughout its various periods of growth, a considerable number of blocks of the extremities of the platted area will be temporarily withheld from sale, and the first public improvements will be installed only in the district of logical earliest development and will be extended little in advance of demand.

A Beautiful Example of Library Architecture



VERMONT SQUARE BRANCH LIBRARY, LOS ANGELES, CALIF.

Municipal Finance

BONDING

ACCOUNTING

TAXATION

Detailed Revenues in New Jersey Cities

By Sedley Hopkins Phinney

Executive Secretary, New Jersey State League of Municipalities

THE tables accompanying this article are two selected from six original compilations made by the Bureau of Municipal Information conducted by the New Jersey State League of Municipalities. They appear in the Appendix of a 45-page study of "New Sources of Municipal Revenue" intended as an aid to the harassed city official seeking new revenues. They are practical demonstrations of actual revenue possibilities disclosed by the experience of cities of various sizes.

Table I is entitled "Classified Revenues of New Jersey Cities in 1920." It was compiled from the latest municipal audits available, on file in the State Department of Municipal Accounts. The figures are revenue accruals, not actual cash receipts, and the classification used is that of the United States Census Bureau slightly modified. As the audits failed to report fully on certain classes of revenue, the following were omitted from the tabulation, and the individual figures were given in the text: Special Assessments, Subventions and Grants, Donations and Gifts, Rates, Highway Privileges, and Rentals of Equipment.

The individual figures were built up by a classification of all the items appearing in the audits, usually necessitating going into the cash receipts of the mayor, city clerk, city engineer, health department, library, etc. In many cases, it was not possible to be sure of the proper classification of an item, and many figures given were lump figures which could not be divided. The table represents the best that could be done with the material at hand.

Since the cities have been arranged in order of population, cities of comparable size are automatically brought together, and the city official can readily run his eye over

the columns and see how his revenues in each class compare with those of other cities. By quick computations the actual per capita comparisons can be made of striking figures.

Take a few examples of the use of the tables by a city official. Camden and Trenton are nearly the same size, and their total revenues are almost identical, yet for Trenton the interest on bank balances is twice that for Camden, while the item "All Other Interest and Costs" is six times as great. What is the reason for this? The Camden official who is curious about this item would make a careful survey of all factors involved, interest rates, amounts of money on deposit, whether short-term or long-term deposits, stringency of enforcing interest and cost charges on delinquent taxes, and other similar matters. The chances are that this search would disclose wastes or unused revenue possibilities. Inequalities in the collection of the poll tax are still more startling. Jersey City, with a population of three-quarters that of Newark, collects about one-fourteenth as much poll tax; and only one-quarter of the amount collected by Trenton, which has about one-half of Jersey City's population. Other inequalities suggest either laxity of collection or an inherent defect in this form of tax, probably both. The purely nominal amount of rentals of land and buildings in some cases raises a query. For instance, what is it that Bayonne rents for \$75 per annum, and South Amboy for \$25? Could not full market values be charged for these properties? It must be understood that these questions are purely illustrative and are not criticisms of these particular administrations.

Probably the most significant and most fruitful of enhanced revenues are the columns "Fees and Charges" and "Licenses

	Popula- tion	Property Tax	Poll Tax	Gross Receipts	Tax Franchise	Licenses and Permits	Fines and Forths	Fee and Charges	Rentals of Land and Buildings	Interest on Bank Balances	All Other Interest and Com	Total Interest	Miscel- laneous	Total Revenues
Newark	414,524	\$18,287,622.63	\$101,244.00	\$705,419.08	\$337,239.66	\$321,170.51	\$64,627.62	\$94,663.18	\$96,704.78	\$56,432.69	\$132,922.05	\$287,264.07	\$17,962.53	\$20,143,548.33
Jersey City	298,103	11,216,989.95	7,177.00	264,486.79	130,677.32	69,850.34	13,707.00	81,609.80	34,625.56	16,362.87	132,103.91	189,354.74	48,594.98	12,028,478.50
Paterson	135,875	1,699,656.47	4,922.50	71,352.46	177,826.02	31,476.40	10,637.70	46,299.95	620.00	16,362.87	132,103.91	96,490.21	6,937.30	2,172,325.75
Trenton	119,289	1,963,648.63	29,121.00	55,856.63	10,313.18	47,365.08	18,462.64	48,488.32	7,322.87	16,362.87	132,103.91	135,741.04	6,432.80	2,416,324.39
Camden	116,309	1,284,474.62	13,036.00	125,415.31	135,699.31	21,559.69	23,083.28	16,715.01	6,544.01	8,579.64	24,961.67	33,441.31	29,493.85	2,262,725.69
Elizabeth	95,783	1,284,190.85	22,699.00	36,297.04	106,444.40	24,838.71	14,413.13	19,192.89	1,844.00	14,021.80	20,138.42	34,160.22	3,454.72	1,729,546.13
Bayonne	76,754	2,167,306.32	1,572.00	14,221.95	46,602.13	35,287.85	10,920.42	351.00	75.00	14,400.64	13,680.52	28,081.16	9,771.39	2,314,189.22
Hoboken	68,166	1,617,088.14	2,169.00	28,419.35	39,333.86	18,451.07	10,183.55	20,570.73	5,075.00	18,005.95	19,251.68	37,257.63	330.86	1,779,273.19
Passaic	63,841	973,787.82	4,654.00	21,028.33	58,730.47	19,310.36	22,744.07	2,326.36	411.50	3,978.73	18,629.05	22,607.28	18,501.72	1,148,904.48
East Orange	50,710	1,251,144.02	7,673.50	37,093.35	58,497.66	41,398.73	1,478.18	7,638.46	391.00	10,543.59	10,005.52	20,549.11	10,858.15	1,381,201.06
Atlantic City	50,707	1,516,070.52	10,129.00	47,245.84	159,677.00	207,215.35	11,743.90	2,447.20	680.00	9,363.73	38,041.02	47,408.75	17,204.86	2,019,172.42
Perth Amboy	41,707	702,788.38	1,036.00	14,676.64	28,774.98	5,933.09	11,110.57	11,742.50	75.00	1,749.91	19,091.40	11,045.20	3,544.78	806,832.14
Orange	33,268	465,365.23	2,096.00	21,183.32	45,710.82	6,970.17	6,196.25	12,822.12	7,317.04	10,543.59	10,005.52	20,549.11	1,140.84	609,670.45
New Brunswick	32,779	471,970.44	5,456.89	14,762.88	36,468.80	10,467.94	4,737.19	2,280.00	720.05	10,543.59	10,005.52	20,549.11	1,140.84	607,695.29
Plainfield	27,700	389,131.86	5,632.00	21,426.87	40,731.97	8,095.33	5,627.58	7,638.46	704.18	1,447.86	4,174.72	19,436.34	3,104.25	501,528.84
Clifton	26,470	42,790.80	1,346.00	3,403.29	39,552.87	4,972.80	4,955.25	3,615.10	174.00	3,586.05	5,656.88	9,242.93	4,613.23	115,929.72
Garfield	19,381	323,855.30	1,931.00	1,132.04	10,027.71	5,393.20	3,450.91	263.25	174.00	3,273.15	5,730.37	9,003.52	581.54	379,816.67
Millville	11,627	94,995.50	3,731.00	8,361.79	13,215.85	1,212.06	1,212.06	1,212.06	731.04	1,497.91	19,091.40	20,841.31	3,544.78	123,970.12
Bridgeton	14,325	83,010.58	3,759.00	8,901.30	11,444.25	5,283.60	1,403.05	1,403.05	720.05	10,543.59	10,005.52	20,549.11	1,140.84	607,695.29
Long Branch	13,521	366,116.62	2,061.00	14,387.08	35,737.27	4,799.33	2,003.00	532.00	210.00	1,447.86	4,174.72	5,622.58	55.00	431,313.88
Asbury Park	12,400	562,282.00	None	3,406.27	9,483.45	49,211.60	3,723.25	1,503.45	153,238.18	661.45	42.25	703.70	5,580.16	789,236.04
Gloucester	12,162	184,145.56	2,700.00	3,397.49	6,922.71	2,429.08	777.82	1,607.74	600.00	1,607.74	899.87	1,060.61	297.68	202,576.95
Englewood	11,627	338,265.45	800.00	7,759.35	22,763.87	1,640.58	2,878.20	893.05	600.00	1,607.74	899.87	1,060.61	297.68	182,252.23
Rahway	11,042	142,937.87	2,563.00	4,216.72	17,589.93	2,255.75	1,529.41	2,582.00	330.00	1,447.86	4,174.72	5,622.58	55.00	183,085.27
Summit	10,174	185,909.27	1,620.00	5,599.88	17,478.73	2,671.95	105.57	1,539.00	17.50	1,447.86	4,174.72	5,622.58	55.00	220,237.27
Burlington	9,049	74,699.27	1,893.00	5,831.79	14,990.06	286.00	405.00	593.33	593.33	315.00	2,467.66	2,782.66	803.67	102,334.78
South Amboy	7,897	68,775.90	1,832.00	4,035.21	8,221.92	431.85	338.50	25.00	25.00	232.74	165.20	397.94	392.33	84,454.65
Salem	7,435	278,269.55	1,616.00	2,885.06	2,768.34	445.00	130.25	6.00	193.00	232.74	165.20	397.94	392.33	924,84
Pleasantville	5,887	87,616.60	893.00	2,165.62	3,938.35	1,671.01	57.00	100.00	10.00	1,447.86	4,174.72	5,622.58	55.00	98,248.40
Woodbury	5,801	59,314.23	1,200.00	4,000.00	6,500.00	1,888.87	100.00	343.05	17.50	1,447.86	4,174.72	5,622.58	55.00	76,548.50
Lambertville	4,660	31,039.31	1,012.00	1,410.98	1,416.39	233.50	55.50	26.50	717.50	1,447.86	4,174.72	5,622.58	55.00	35,702.95
Bordentown	4,371	28,861.78	817.00	2,704.69	6,583.92	663.00	871.00	26.50	717.50	1,447.86	4,174.72	5,622.58	55.00	44,107.07

CLASSIFIED REVENUES OF NEW JERSEY CITIES IN 1920. (TABLE I)

City	Population	Amusements	Trade and Mercantile	Pauper, etc.	Transportation	Hazardous and Unhealthy Business	Advertising	Sewer and Street Opening	Theatre and Moving Picture	Health	Building	Miscellaneous and Unsegregated	Total
Newark	414,524									\$15,782.95	\$49,439.22	\$255,948.34	\$321,170.51
Jersey City	298,103		7,584.50	\$13,665.00	\$36,742.80	\$4,722.00	\$2,438.85	\$5,763.00	\$96.00	13,867.00	13,867.00	5,893.00	69,850.34
Paterson	135,876			1,640.50	1,420.00			1,016.00		2,567.55	2,567.55	6,567.00	31,476.40
Trenton	119,289							4,732.00	1,202.70	2,119.50	7,005.45	38,916.52	47,365.08
Camden	116,309	885.00	6,450.00		337.50	1,236.55	1,243.50					2,050.51	26,783.71
Elizabeth	95,783												24,838.71
Beyonne	76,734				16,258.80			2,812.21	555.00			5,212.70	35,287.85
Hoboken	68,166		1,071.00	867.00	1,545.50	375.00	609.50	1,835.61	2,722.00	6,386.10	2,303.76	4,997.50	24,180.43
Passaic	63,841		1,988.50	1,254.42	3,775.04	960.00	320.00	1,538.00	552.00	840.00	5,104.40	2,978.00	19,310.36
East Orange	50,710	100.00		20.00	2,018.87	883.00			400.00			37,986.86	41,398.73
Atlantic City	50,707	8,253.00	132,404.82	6,932.50	25,977.50	5,051.30	767.00	12,512.38	Under Amusements	438.00	12,540.25	2,368.60	207,245.35
Ferth Amboy	41,707				3,337.97						1,439.37	1,155.75	5,933.09
Orange	33,268		50.00	598.25	1,270.00				300.00	75.50	736.00	4,752.92	6,970.17
New Brunswick	32,779	910.00			375.00	248.00		186.00		153.00		1,685.00	4,215.50
Plainfield	27,700				580.83							7,361.50	8,095.33
Clifton	26,470		679.30	300.00		328.00		55.00	175.00	985.70	1,181.50	2,234.00	4,972.80
Garfield	19,381		1,455.00					1,425.50				1,526.00	5,393.20
Bridgeton	14,323	147.00	175.60	100.00	313.50	16.00		3,489.00	110.00			532.50	5,283.60
Long Branch	13,521											4,799.33	4,799.33
Asbury Park	12,400	20,607.45	26,600.40					615.00			769.00	619.75	49,211.60
Gloucester	12,162												2,429.08
Englewood	11,627	20.00	7.00	290.00	202.65			89.00			423.50	1,916.58	2,429.08
Rahway	11,042				290.75						529.00	541.93	1,640.58
Summit	10,174				442.10			.76.00		462.00	492.00	1,543.00	2,255.75
Burlington	9,049	200.00									677.00	1,090.85	2,671.95
South Amboy	7,897											10.00	286.00
Salern	7,435				336.85							95.00	431.85
Pleasantville	5,887											445.00	445.00
Woodbury	5,801	45.00	700.00	115.12	180.00			187.75	50.00	41.51	333.00	1,629.50	1,671.01
Lamberville	4,660											278.00	1,888.87
Bordentown	4,371											233.50	233.50
												663.00	663.00

REVENUE FROM LICENSES AND PERMITS IN NEW JERSEY CITIES IN 1920. (TABLE V)

While the chief source of municipal revenue is, and probably always will be, taxes on real property, the study of the revenue possibilities in special business taxes may prove very profitable. Under certain circumstances, such taxes may be advantageously levied to raise additional funds or to lighten the burdens on real estate

and Permits." The variations here are a reflection of the facts brought out in other tables in the Appendix which show the actual license fees charged for almost every conceivable purpose in New Jersey cities and towns. We find Atlantic City, with a population one-quarter greater than Perth Amboy, having a revenue from licenses thirty-four times greater than the latter. When we consider the resort character of Atlantic City and the scale of fees charged there, the difference is understandable. There are other differences, however, that are only explainable by variations in scope and amount of licensing and that represent huge revenue possibilities if the officials choose to follow the example of their neighbors.

In an attempt to analyze these differences, Table V was prepared. The individual items from which the various totals of revenues from licenses and permits were made were distributed among eleven main groups, as follows:

1. *Amusements.*—Includes pool, bowling, dance halls, carnivals, but not theaters.
2. *Trade and mercantile.*—Includes all trades and mercantiles not shown elsewhere.
3. *Pawnbrokers, etc.*—Includes pawnbrokers, auctioneers, junk dealers, and peddlers.
4. *Transportation.*—Includes auto, jitney bus, horse-drawn vehicle, street car, taxicab, hack and express.
5. *Hazardous occupations.*—Includes all pursuits involving risk to the community, such as garage, blastings, gas tanks, explosives, firearms, gasoline pumps and tanks, and hoisting.
6. *Advertising.*—Includes bill-boards, signs, bill posting and distributing.
7. *Sewer and street openings.*—Also includes water.
8. *Theaters and moving pictures.*
9. *Health.*—All occupations involving inspections by health authorities. Milk and ice dealers, scavengers, pig raisers, cesspools and dump picking.
10. *Building.*—Also electrical and plumbing permits.
11. *Miscellaneous and unscgregated.*

Although the incompleteness of the original data has prevented the complete detailing of this table, enough is shown to form many interesting comparisons. For ex-

ample, why did East Orange, population 50,000, get only \$100 from amusement licenses while New Brunswick, population 33,000, received \$910? Does Paterson have more pawnbrokers and auctioneers than Camden? Although the cities have nearly the same population, their respective revenues from this source were \$13,665 and \$1,640. And why did Jersey City get \$36,743 from transportation fees and Paterson only \$1,420? The most striking contrast is that of Atlantic City's revenues from trade and mercantile licenses, of \$132,404 against the same item of \$50 from the residential city of Orange. The difference is readily understood in this case because of the character of the two cities.

When it is considered that city administrators are largely amateurs, coming and going with political changes, and that few agencies of standardization and information like the Bureau are in existence, it is not surprising that there are the variations brought out in these tables; it is surprising that there is not more variation. This report is one of fifty published by the Bureau during the year which are intended to help officials toward uniformity of practice and scientific methods. Within a month of publishing the report, one mayor reported a complete revamping of his city's scale of license and permit fees, and said that this one report alone had been worth to his city more than their share of the cost of maintaining the Bureau.

The most important single conclusion reached in the preparation of these tables is that there ought to be a state-wide compulsory uniform system of municipal accounting, so that comparisons of this sort can be made regularly and currently by newspapers and citizens' organizations without the labor involved in this case. Figures should be comparable and accounts mean the same thing, thus enabling citizens to compare revenues and costs of their government with others, and one year with another. An enlightened citizenry is necessary for true democracy and sound municipal accounting will do much to sweep the cobwebs away.

Motor Service for City Work



HOLT CATERPILLAR TRACTOR HAULING TROY TRAILERS IN THE CONSTRUCTION OF THE VICTORY MEMORIAL DRIVE BY THE BOARD OF PARK COMMISSIONERS OF MINNEAPOLIS, MINNESOTA

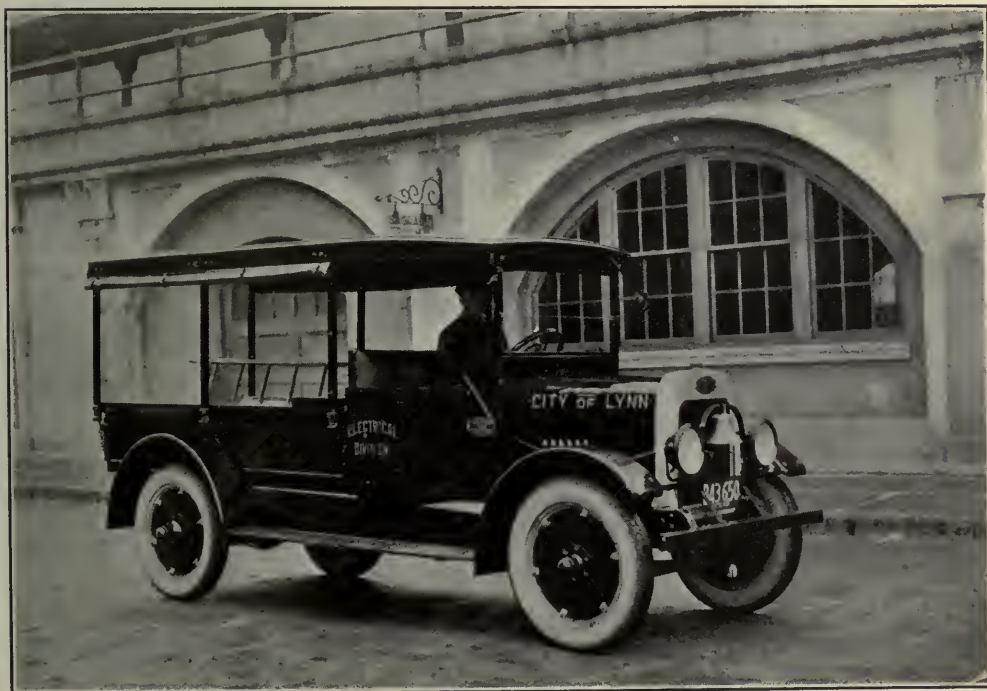


A BUCYRUS DRAG-LINE BACKFILLING ON THE WETHERBY SEWER, DETROIT, MICH.
Blaw-Knox collapsible steel forms are being used on this job by the contractors, Nash Brothers, Chicago, Ill.



AN AMERICAN-LA FRANCE ENGINE OF THE GRINNELL, IOWA, DEPARTMENT MAKES SHORT WORK OF A JANUARY FIRE

This truck carries a 65-gallon chemical tank, 3,500 feet of hose, two 50-foot ladders, one 40-foot ladder, one 10-foot roof ladder, and one 20-foot roof ladder



A GRAMM-BERNSTEIN SPEED TRUCK EQUIPPED FOR ALL-ROUND SERVICE IN THE ELECTRICAL DIVISION OF THE LYNN, MASS., FIRE DEPARTMENT

This truck answers all alarms to look after the wiring of the Fire and Police Departments



Concrete Pavement, Troy, N. Y.
Hard-n-tyte Road Treatment used.

Five years from now go out and try to find soft spots in *that* concrete!



For over twenty years the General Chemical Company has been at the forefront of chemical research and manufacture in this country. Hard-n-tyte is the latest contribution of its splendid staff of chemists. It is the successful result of long search for a concrete hardener that really hardens the surface and materially increases its life. It enables engineers and contractors to deliver a quality of concrete work far in advance of anything that has been possible heretofore.

Don't take my word for it—just watch that road stand up under traffic. Give it a good "going over" every six months. Don't just sit in your car—get out and walk, so you can see better. You've probably got a cold chisel in your tool box—take it out and see how much dust you can raise on that road with it. That's one way to find out what the Hard-n-tyte Road Treatment really does for a concrete road.

The other way is to do just as the General Chemical Company engineers did, and grind standard concrete road slabs, 1:2:3 concrete, for 1,800 revolutions in a Talbot-Jones rattler charged with 200 lbs. of iron shot. Half the slabs were treated with Hard-n-tyte, just as this road has been treated. Half of them were left untreated. When the test was fin-

ished, the slabs treated with Hard-n-tyte showed 30% less wear than the others.

Hard-n-tyte is the trade name applied to pure white crystals of magnesium zinc fluosilicate. When these crystals are dissolved in water and the solution flushed over a concrete road, the surface becomes flint hard. This condition is caused by the formation of insoluble and extremely durable silicates and fluorides within the concrete itself.

Hard-n-tyte is cheaply applied by common labor. Concrete roads treated with Hard-n-tyte wear like mosaic.

Send us your name and address and let us help you eliminate raveling, soft spots and ruts in the concrete roads you build this year.

General Chemical Company
1711 Broad Exchange Building, New York City

Hard-n-tyte Road Treatment

—makes concrete roads wear longer

Chamber of Commerce Activities in Public Affairs

Summer Schools at Evanston, Ill., and Palo Alto, Calif.

The decision having been reached that the National School for Commercial Secretaries, established in 1921 under the joint auspices of the National Association of Commercial Organization Secretaries, the Chamber of Commerce of the United States, and Northwestern University at Evanston, Ill., is to be continued as a regular institution, the American City Bureau has announced its belief that the welfare of the profession can best be served by its withdrawal from the national summer school field.

The Bureau has volunteered to place at the disposal of the Board of Managers of the National School its seven years of experience in the conduct of Summer Schools for commercial organization secretaries, and subscribes to the principle that the profession—which is now in a position to do so—should control the courses of training to be provided.

The National School, under the same auspices as last year, will be held at Evanston, August 21 to September 2 inclusive. To make Summer School training available for secretaries in the Far Western States, the Bureau's Western School of Community Leadership will be held at the same time at Stanford University, Palo Alto, Calif. For detailed information regarding the National School, requests should be addressed to the Chairman of the Board of Managers, Robert B. Beach, Business Manager, Association of Commerce, Chicago; and particulars of the Western School may be obtained from the American City Bureau, Merchants Exchange Building, San Francisco.

Community Advertising by Means of Films

SAN JOSÉ, CALIF.—The San José Chamber of Commerce, in November, 1920, was the first organization of the kind to present

its annual report to its members and the community in film form, and it is now the first city in the United States to conduct a nation-wide publicity campaign by similar means. The latter idea is not strictly new, but in this case it has been utilized on so stupendous a scale that it is worthy of note. The Chamber's film report attracted attention throughout the country, and so great was the demand for use of the film that several prints were made and they are still being circulated in many western and eastern states. Encouraged by this success, the manager of the Chamber engaged the services of an expert film photographer and personally superintended the taking of pictures in all parts of the Santa Clara Valley, of which San José is the chief city, showing every phase of the valley's attractions and advantages, and making up a film of 2,000 feet, under the title, "Journeys Through the Valley of Heart's Delight." Several prints of this film were made, one of which is running daily in the California State Exposition Building at Los Angeles, through which a quarter of a million tourists pass during the year.

Since the film was produced, communications have been received from many of the largest distributing organizations in the United States offering to distribute copies to the public they serve, free of charge to the Chamber. The Photographic Department of the Ford Motor Company, after inspecting a print of the film, urgently requested 76 prints, to be delivered within three weeks. The big job of making the 152,000 feet required was completed in four weeks, and soon thereafter the prints were released through 32 Ford exchanges in this country to 2,500 theaters. The Ford people estimate that these prints will be seen by approximately 40,000,000 persons, so that at least 30,000,000 would be a conservative number. The 76 prints cost the Chamber \$7,000 for the making, or about 4½ cents per foot, to which should be added about

KANSAS City selected this beautiful Flemish design standard created by the General Electric Company and manufactured by the King Manufacturing Company for its Park, Street and Boulevard lighting.



King Manufacturing Co.,
53 W. Jackson Boulevard Chicago, Ill.

\$500 for taking the pictures. The distribution costs the Chamber nothing.

The number of prints that could be utilized without further expense to the Chamber beyond the cost of production seems to be limited only by that organization's ability to finance the prints. Francis Holley, of the Bureau of Commercial Economics, Washington, D. C., has requested 20 copies; The National Non-Theatrical Motion Pictures Company asks for five copies; the Union Steamship Company of New Zealand offers to run the film in the best picture houses in New Zealand, Australia, England, India, and possibly South Africa; prints are being circulated by the Bureau of Visual Instruction of the University of Wisconsin, the University of Illinois and the University of California, and several other large distributing organizations stand ready to circulate prints as soon as they can be supplied.

ROSCOE D. WYATT,
Manager, San José Chamber of Commerce.

Auto Tourists Appreciate City's Hospitality

CORPUS CHRISTI, TEX.—Although Corpus Christi has for years been one of the most popular and well-patronized health and pleasure resorts of the Southern coast, until recently it was without a public camping park where tourists could camp while on their vacation.

The Commercial Association, after its reorganization in May, began to consider the advisability of establishing a free tourist park. A committee was set to work to ascertain how many tourists visited the city in automobiles and camped, and what percentage of them left the city because camp

grounds were not afforded. The committee called into conference a number of business men and officials of the Rotary, Kiwanis and Automobile Clubs. The proposition was put up to the meeting and the survey read.

At this meeting it was decided that a fund of \$600 would be raised to secure a five-year lease on a certain tract of land within ten blocks of the business section of the city and situated on and overlooking Corpus Christi Bay, and to equip it with toilets, water, electric lights, gas and other conveniences. The Commercial Association contributed \$300, the Rotary, Kiwanis and Automobile Clubs \$100 each, thereby subscribing the money necessary within thirty minutes. Plans had already been drawn, and work upon the new tourist park started the following morning, with the result that within a week after the committee meeting, Corpus Christi had one of the most complete and up-to-date free parks in the South.

The tourists have organized what is known as the "Tin Can Tourist Club" and hold meetings nightly, in the interest of sanitation, safety and comfort.

The city furnishes water free, the electric light company cuts its rates in half, and \$200 maintains the camp grounds for a year. Corpus Christi's tourist traffic has already picked up 50 per cent, and local merchants declare their trade has advanced accordingly. It is conservatively estimated that the camp ground, which cost \$800, including one year's maintenance, has in the first three months resulted in \$60,000 being spent in the city which otherwise would have gone elsewhere.

J. C. CARTER,
General Secretary, Corpus Christi Commercial Association.



CORPUS CHRISTI, TEX., HAS JOINED THE LIST OF THOSE CITIES WHICH PROVIDE REAL HOSPITALITY FOR TOURISTS



Making School House Steps Safe

Architectural attractiveness was a factor—it was essential that every step be made slip-proof and safe—the steps had to be made durable—maintenance costs had to be eliminated—

The architects (Frost & Chamberlain) of the Worcester Girls' Trade School, Worcester, Mass., a beautiful \$350,000 building, solved this stairway problem with ALUNDUM SAFETY TILE. The stairtreads are cast iron with steel risers. The cast iron tread is depressed to receive the tile which is set in cement mortar.

Thus every step in the building, two sets of stairways from shower baths to the top floor, are made slip-proof, trip-proof and wear-proof and the architects were able to get the desired harmonious effects.

ALUNDUM SAFETY TILE is manufactured by

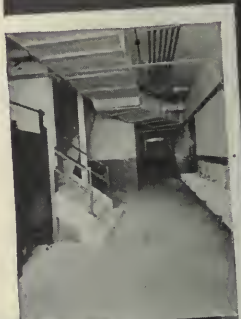
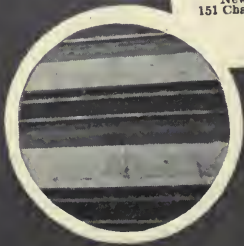
NORTON COMPANY
Worcester, Mass.

New York
151 Chambers St.

Chicago
11 No. Jefferson St.

Detroit, 233 W. Congress St.

T31



Elizabeth Chamber Backs Big Public Improvement Program

ELIZABETH, N. J.—The Chamber of Commerce is supporting a number of movements, which, if carried into effect, will mean important developments in the city. The Chamber encouraged and finally endorsed an elaborate plan of the Board of Works for the purification, widening and deepening of the Elizabeth River. The plan will cost about \$3,000,000, and this expenditure might be distributed over a period of years without disturbing the value of the plans.

Having successfully sponsored a zoning plan, which was officially adopted by the City Council on February 6 for the city, the Chamber is now bending its efforts toward the adoption of a general city plan. A committee is at work on this proposition.

By organizing a new association known as the Union County Park Association and working under that name, the Chamber of Commerce Committee was instrumental in securing the appointment of a Union County Park Commission, which will develop parks and playgrounds throughout the entire county.

The Chamber is also active in protecting the interests of the city under the changes contemplated by the Authority of the Port

of New York. The specific demands are that any alterations in existing conditions must keep the transportation facilities of Elizabeth as good as, or better than, they are at present, as upon transportation depends the continued growth of the city.

M. D. GRIFFITH,
Secretary, Elizabeth Chamber of Commerce.

Two Towns Unite to Provide Tourist Camp

ALBANY, ALA.—As a result of the activities of the Chamber of Commerce, public-spirited citizens of Albany and Decatur have fitted up a tourist camp.

This differs from most other such camps in that it is entirely enclosed and covered. The former "Bob Jones Tabernacle" was purchased, and fitted to accommodate fifty cars. All conveniences are provided, such as a gas stove for cooking, a coal stove for heating in cold weather, and running water. Inside the tabernacle, another room, 20 by 20 feet, is enclosed, which is comfortable even on the coldest days.

Under the name of the Albany-Decatur Community Club, the camp is supported by the citizens of both towns, funds for maintenance being provided by donations and subscriptions.

W. W. RAHN,
Vice President, Albany Chamber of Commerce.



AN INVITATION TO STAY OUT



AN INVITATION TO COME IN

The Chamber of Commerce of Springfield, Ill., has been active in making the second picture possible



MUELLER Wiped Joint Goose Necks

Made in all sizes from $\frac{3}{8}$ to 2" — with lead pipe 18 to 36 in. long — and come singly as shown and with 2, 3, 4, 6 and 8 branches — they are standard connections for service work.

The fact that the wiped joints are made by workmen who do this one thing well day in and day out insures uniform quality — and a better and less costly job than could be done on the ground.

Write for descriptions and prices.

H. MUELLER MFG. COMPANY, DECATUR, ILL., PHONE BELL 153

Water, Plumbing and Gas Brass Goods and Tools

New York City, 145 W. 30th St., Phone Watkins 5397

San Francisco, 635 Mission St., Phone Sutter 3577

Sarola, Ontario, Canada

Mueller Metals Co., Port Huron, Mich., Makers of "Red Tip" Brass Rod; Brass and Copper Tubing; Forgings and Castings in Brass, Bronze and Aluminum; Die Castings in White Metal and Aluminum; also Screw Machined Products.

Telling the Public About Its Roads

JOHNSTOWN, PA.—The Johnstown Chamber of Commerce is conducting an educational campaign to interest the people of Cambria County in road construction. On the back of the Chamber letter paper is a county road map, the roads being printed in different colors. By means of the key, one can quickly see what part of the county program has been finished, what is under construction, and by whom and at whose expense the work is being done. Purple lines represent county aid roads near completion; red lines, state aid roads in process or completed; green lines, state aid roads applied for by the County Commissioners; and yellow lines, roads for which county aid has been applied for by the Supervisors.

Cambria County is in a mountainous district in the heart of the soft-coal region. Its good roads program got a late start, but there are now 115 miles of hard roads finished and enough funds available to complete a comprehensive program reaching all centers of population or industry.

JOHN E. GABLE,
Managing Secretary, Johnstown Chamber of Commerce.

Turning Waste Space Into a Memorial Park

CALUMET, MICH.—The Keweenaw Peninsula has long been known for its wild life, its scenic beauty and its copper mines, yet the district has been lacking in parks made and maintained in the cities and towns of the little wonderland.

At Calumet, which is the metropolis of the district, the mines are segregated from the town by a field of 17 acres. This space was made after the town had been destroyed by fire half a century ago. Residents of Calumet at that time believed that the space between the mines and the town would prevent the spread of another fire.

For years this open space was used as a baseball field and playground. Over a year ago the mining company engaged a landscape artist to build a park on the ground in memory of the founder of

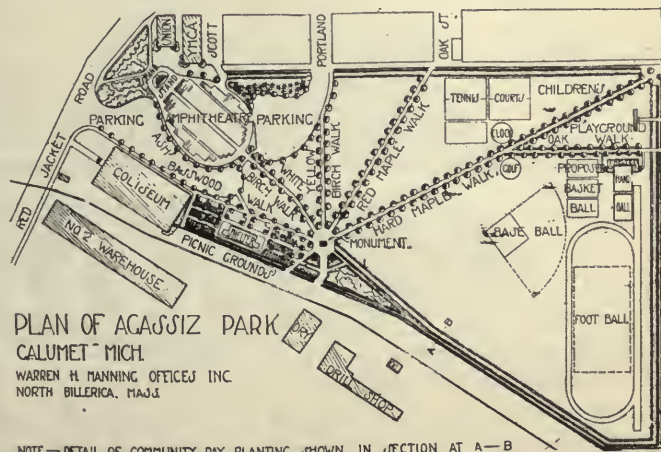
the mines, Alexander Agassiz, the famous geologist.

The sketch shows the park as it will appear when completed. In the center of the circle from which all lanes lead will be a large monument of Mr. Agassiz, and the pathway will be lined with birch, maple, elm and oaks. The exterior trees are evergreens from the forests surrounding Calumet, and the interior rows are poplars. Wild flowers and shrubs will be planted along the outside of the park parallel with the evergreens, and cultivated flowers will be planted in the interior, where they will receive more sunshine.

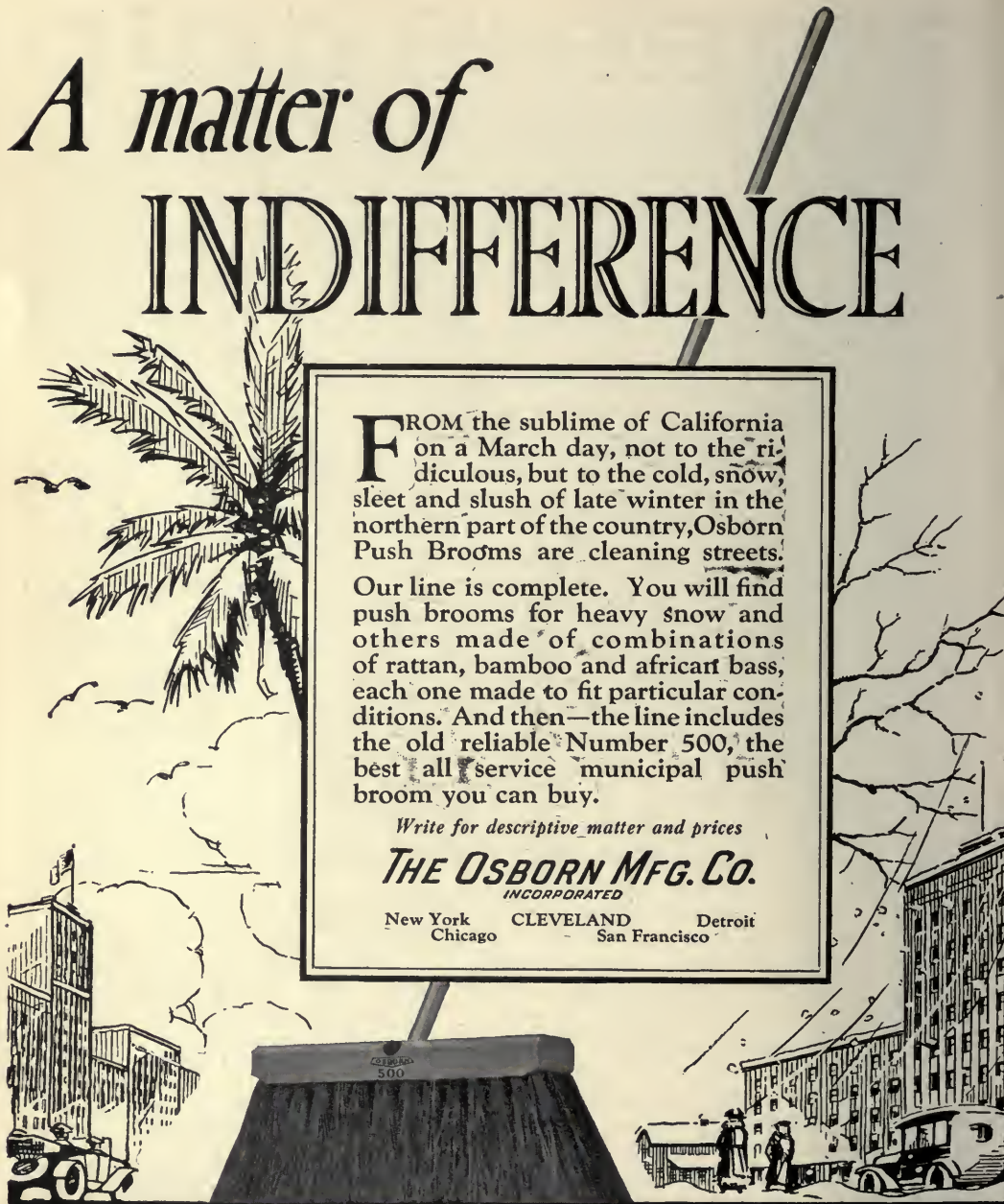
The park will be thoroughly supplied with modern equipment. A large gridiron and baseball diamond is planned for the northern end to take the place of the present field. An amphitheater and a band-stand will be erected at the southerly end near the Colosseum, which is one of the largest ice skating-rinks in the country. Near the band-stand will be an auto park large enough to accommodate several hundred automobiles. A picnic shelter and numerous tables are planned.

The Calumet Chamber of Commerce is planning a Community Planting Day at which all school children in Calumet will be allowed to bring cultivated and wild flowers to plant in the park. The planting will be attended to by citizens of the town, and after the work is done the children will be allowed to take care of their own plants and study the growth.

G. T. MURPHY,
Secretary, Calumet Chamber of Commerce.



A matter of INDIFFERENCE



FROM the sublime of California on a March day, not to the ridiculous, but to the cold, snow, sleet and slush of late winter in the northern part of the country, Osborn Push Brooms are cleaning streets.

Our line is complete. You will find push brooms for heavy snow and others made of combinations of rattan, bamboo and african bass, each one made to fit particular conditions. And then—the line includes the old reliable Number 500, the best all service municipal push broom you can buy.

Write for descriptive matter and prices

THE OSBORN MFG. CO.
INCORPORATED

New York CLEVELAND Detroit
Chicago San Francisco

OSBORN

BRUSHES

BROOMS

LARGEST MANUFACTURERS of INDUSTRIAL BRUSHES AND BROOM

Americanization in Rochester

ROCHESTER, N. Y.—The Rochester Chamber of Commerce organized a Council for Better Citizenship in 1920. One of its aims is to impress upon the new citizens their privileges and responsibilities and to interest the native-born in his new brother. The Council consists of five committees: New Citizens Committee, Service Bureau Committee, Education Committee, Legislation Committee and Racial Advisory Committee.

The members of the New Citizens Committee appear at court on naturalization days and greet the newly-made citizens. During the year five big dinners are given at the Chamber, to which the new citizens are invited. Here the Chamber members mix with the new citizens in the proportion of about two or three to six. Exercises are held and the final certificates of citizenship delivered. In 1921 over 1,370 new citizens were greeted, and of this number about 1,000 attended the dinners.

The Service Bureau during 1921 maintained a central office at the Chamber for the help and information of the foreign-born. Also three part-time offices were run at local centers one evening a week in the schoolhouses. During the year there were over 5,000 callers at the Bureau. Assistance was extended in about 400 instances to families or individuals who needed help in reuniting families. Other service included information as to citizenship papers; translating letters; encouraging the learning of English; directing unemployed; obtaining money on undelivered money orders, unused steamship tickets, and twice-paid bills; tracing telegrams and express shipments; and correspondence with American consuls and state department officials.

The Education Committee recently conducted a "Learn English" drive. In the Chamber, 250 teams were formed, consisting of one Chamber or Council member and an interpreter or team-mate. The pledges taken covered promises to join a class in English or citizenship. Reports show that approximately 2,000 pledged themselves and that already half of these have registered in classes.

The Racial Advisory Committee has conducted "Know Your Country" meetings in foreign sections of the city. Speakers and entertainment are provided. During the fall of 1921 over 9,000 persons attended the

12 meetings held; and 6 more meetings with an attendance of approximately 5,500 were held in January, 1922. The report for the year shows that there were more than 20,000 personal contacts.

Miss M. E. Bingeman, Secretary of the Council for Better Citizenship, is the directing force, under the supervision of the General Secretary of the Chamber. No other movement or enterprise in Rochester has such a command upon the time and energies of the best and most active men in the Chamber and among the citizenship in general, and no other inspires such enthusiasm as does this undertaking.

The Council's plans for the future are ambitious, among them one that will follow up the work in the past to see just what the effect has been. The idea is not to keep any surveillance over new citizens or foreign-born, but merely to continue the friendly relationship and practical assistance which makes for confidence and community good-will.

JULIAN KILMAN,
Federal Naturalization Examiner.

The "Made and Trade in Brockton" Exhibit at the Brockton Fair

BROCKTON, MASS.—Any community wishing to give itself a boost will do well to read the chapter just written by the Brockton, Mass., Chamber of Commerce in connection with the big "Made and Trade in Brockton" exhibit at the Brockton Fair.

This exhibit has brought Brockton manufacturers and merchants into an intimacy of business relationship which has greatly benefited the city's industrial and commercial life. Manufacturers have learned, through the various displays, that they can secure made-in-Brockton materials which heretofore they have purchased outside the city. The same is true of the merchants, who, as a result of the exhibit, now know that there are local manufacturers who can supply their needs in sundry kinds of merchandise. For example, one of our shoe manufacturers, employing more than 3,500 operatives, learned from one of the displays that another Brockton manufacturer made shoe accessories. The shoe manufacturer immediately placed a large order with his fellow business man. Of Brockton's annual business of \$125,000,000, it is estimated that at least \$30,000,000 goes for purchases from outside sources. It is our intention to



Dundee Road, Elgin Township, Elgin, Ill., gravel macadam maintained with "Tarvia-B"



Typical Spring conditions on a soft-surfaced road

Save the *old* roads--- then on with the *new*---

Every Spring finds scores of communities inaugurating systematic programs of salvaging the roads already built—putting *them* in shape to handle the growing traffic before new construction is begun.

The economy of such a sound Good Roads Program appeals to taxpayers everywhere.

How about the roads in your community? Quite likely the old, worn-out macadam that you have thought worthless can be quickly and cheaply restored to usefulness by a traffic-proof Tarvia top.

There may be other stretches that need nothing more than the time of a patrol crew to patch them with "Tarvia KP"—or a simple treatment of "Tarvia B" to preserve the surface and make it traffic-proof and weather-resisting.

Tarvia roads are mudless, dustless, waterproof and automobile-proof 365 days in the year. Their low first cost and economy of maintenance places good roads and their many advantages within reach of the most modest community.

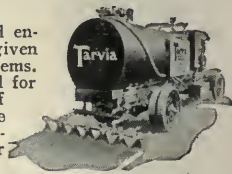
Illustrated booklets descriptive of the various Tarvia treatments free on request.

Tarvia

*For Road Construction
Repair and Maintenance*

Special Service Department

This company has a corps of trained engineers and chemists who have given years of study to modern road problems. The advice of these men may be had for the asking by anyone interested. If you will write to the nearest office regarding road problems and conditions in your vicinity, the matter will be given prompt attention.



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St. John, N. B.

Cleveland
Washington
Bethlehem

Cincinnati
Syracuse
Johnstown
Elizabeth

Pittsburgh
Salt Lake City
Lebanon
Buffalo
Halifax, N. S.

Winnipeg

Vancouver



LOOKING DOWN THE AISLE OF THE EDUCATIONAL BUILDING OF THE BROCKTON, MASS., FAIR

increase the volume of at-home purchases until possibly one-half of the \$30,000,000 can be retained in this city.

Brockton is a natural trading center for 250,000 people. More than 300,000 people attended the Brockton Fair. Practically all these visitors at one time or another during the four days of the Fair turned their steps to the Educational Building. It was in this great structure, containing some 50,000 square feet of floor space, that the "Made and Trade in Brockton" exhibit was presented.

Brockton is known far and wide as "the city where they make the shoes"; naturally, the shoe industry played a leading part in the exhibit. In miniature, the Brockton District shoe industry was shown in actual operation—workers at their machines producing made-in-Brockton shoes. Each machine was driven by an individual electric motor. Visitors were privileged to witness in action all the various operations which go to make a pair of shoes.

Possibly the outstanding feature of the entire exhibit was the "Style Show and Trade-in-Brockton" exhibit, in which the manufacturers and merchants combined. Brockton is the first city to present a Style

Show in connection with an agricultural or county fair. It has proved to be one of the most novel of these displays ever held. The runway for the 40 models is the largest in the country, permitting displays of shoes and garments being put to the actual use for which they were manufactured—dancing, tennis, golf, etc.


While it is admittedly difficult to trace results directly to the Fair displays, local business men have stated that from unsolicited quarters orders and new business have come to them which are clearly the result of their advertising at the Brockton Fair.

This trend of affairs, which may be taken to imply more business in the future as the "Made and Trade in Brockton" exhibit grows in size, quality and reputation, quite naturally interests the exhibitors, who at first held to the belief that they could hope for no results other than of doing their part as citizens to make the Fair bigger and better. It has also been most encouraging to the committee in charge, the members of which are approaching this year's exhibit with renewed confidence both in the quality of the show to be staged and the commercial results which will follow.

FRED E. HILTON,
Secretary, Brockton Chamber of Commerce.

HOLLOWSPUN

Lighting Standards



ESSEX County, New Jersey, has used Hollowspun reinforced concrete lighting standards both for the court house in Newark and for park lighting at Nutley. Our new catalog supplement No. 9, containing full information on this type of standard will be sent on request.

**Massey Concrete
Products Corporation**
Peoples Gas Bldg., Chicago

Street Markets in the United States

By **Caroline B. Sherman**

U. S. Bureau of Markets and Crop Estimates

THE picturesque street markets found in some of our small American towns compete with European market squares in individuality and charm. The exploring traveller comes across them in unexpected places and finds a day spent in one of them full of interest and local color.

The street markets in Benton Harbor and St. Joseph, Mich., constitute an interesting development. These cities are surrounded by many extensive vineyards, and the large number of growers probably had an important bearing on the establishment of the type of market at these points, for while in neighboring counties cooperation in marketing has developed among the grape growers, in the street markets of Benton and St. Joseph there is an extreme development of competition among buyers.

A Grape Market

Each day the farmers drive in to certain crowded street corners with wagon-loads of grapes—nothing but grapes. Informal regulations are tacitly agreed to—the farmers' wagons form in lines at these corners, and no buyers pass beyond the lines. The buyers crowd around each wagon as the line moves up, and each makes a bid; the highest is usually accepted. Sometimes when buyers have car-loads or boat-loads nearly complete for shipments, bidding is very brisk. But if the farmer thinks he can secure larger returns by consigning his load by freight or express to some city market, he refuses even the highest bid and drives on independently to the railroad station.

There is much controversy in this region as to whether the returns from cooperative associations or from street sales net the greater profit to the grower. Study shows that naturally the output of the associations maintaining inspection brings the higher average prices, but that the street prices usually reflect very closely the daily quotations from the tributary terminal markets.

A Social Market for Broom-Corn

The farmers of the broom-corn section of Oklahoma are not so sure of the competitive

conditions in the street market of Lindsay, which is devoted exclusively to the sale of broom-corn. But here they bring their product year after year, many of them pressing neighbors and neighbors' teams into service, that they may take their entire crop to this market on a single day. So short is the broom-corn season that this crop has often been harvested by dint of night work with shifts of "broom-corn Johnnies," as the immigrant labor that drifts into this region at harvest time is locally known.

In Lindsay at the height of the broom-corn season the streets are filled from curb to curb by ten o'clock in the morning, and often before that time. Many haul at night in order to get a good location where they can more readily attract the attention of buyers.

Days on this market vary greatly. There are times when buyers are everywhere in evidence, passing from wagon to wagon, examining the bales, sampling the corn and dickering with the farmers. When bids are made by buyers, they are usually considered binding for the day, and the farmer usually stays on to see if he can secure a higher bid. Hundreds of buyers come to Lindsay each year representing manufacturers, wholesale dealers and commission houses.

Roanoke, Va., is planning a modern enclosed market building with steel sheds to shelter growers' wagons, but there are those who will regret to see the passing of the old market square. Here near the center of the city, on land donated for the purpose, every type of farm wagon congregates to offer its simple wares, from the prairie-schooner of the mountaineer to the one-mule team of the local negro. One wagon may be filled entirely with corn in the husk, another with the unsorted apples of the small backwoods farm. Others have well-assorted first-class produce attractively displayed in convenient containers. Here and there are baskets bright with field flowers or the nosegays from old-fashioned gardens—goldenrod, asters, phlox, marigolds and



Another Can Do

“COMMUNITY Water Supply,” “Community Electricity,” “Community Gas,” are so commonplace you give them no more than a passing thought. Are you equally familiar with “Community Heating?”

Arcade, N. Y. heats the business buildings and the schoolhouse, using exhaust steam from the municipal electric light plant. The system will fully pay for itself in a very few years, and then will return about \$5,000 net profit per year from a product formerly wasted.

But the profit is *greater* than this! There are reduced insurance rates, lessened fire risk, freedom from furnacemending, no coal deliveries or ash collections.

For 40 years we have been installing “Community Heating” Systems for Industrial Plants, Institutions, groups of residences, distributing steam through mains like water, gas, electricity; paid for similarly by meter.

Write for complete data regarding cost, operation and profits. Is there exhaust steam being wasted by any plant in your neighborhood?

Ask for Bulletin No. 20-AC on “Adscos Community Heating.” Bulletin No. 158-AC describes “Adscos Heating” for individual buildings; Name of your architect appreciated.

AMERICAN DISTRICT STEAM COMPANY

GENERAL OFFICES AND WORKS

NORTH TONAWANDA, N.Y.

Branches:

First National Bank Building
CHICAGO

30 Church Street,
NEW YORK

Hoge Building,
SEATTLE



Main Street, Arcade, N. Y., showing some of the buildings heated by steam from the Electric Light Plant.

Interior and Exterior of Municipal Light and Heat Plant, Arcade, N. Y.

Circular insert shows main leaving Light and Heat Plant for School Buildings, across the street.

ADSCO HEATING



THE SIMPLEST KIND OF MARKET, WITHOUT STRUCTURES—SUITED TO THE NEEDS OF TOWNS AND SMALLER CITIES

coreopsis. Gay advertising umbrellas are in marked contrast with the quaint hoods of the large farm wagons, even as the gay bandanna on the head of an old-time negress emphasizes the decorum of the faded sun-bonnet of the mountaineer. And in addition to its pictorial quality, this is said to be one of the most successful curb markets.

Whether devoted to the single product of a one-crop region or to the flotsam and jetsam of many farms run by diverse people, these and other unique market centers, developed by local custom through the years, constitute increasingly important commercial features of American cities.

Why Zoning Pays

Zoning sells a town. An unzoned town is like a dead stock of goods on the shelves. Zoning is a flexible harness in which city expansion works; it may be adjusted in case it galls or frets at any point.

Zoning will flatten out the human pyramid, which congestion has created in a crowded portion of the city.

Zoning substitutes method for chance, symmetry for confusion, progression for patch-work, and order for chaos in city development.

Zoning affords for the poor man such security from nuisances and invasions as the rich may provide at great expense.—Charles B. Ball in the Chicago City Club *Bulletin*.



The
**Recognized
Textbook on
Playground
Planning---**

This 128-Page Medart Catalog is recognized everywhere as a text-book on Playground Planning and Installations. It shows in detail just what apparatus is best suited for boys, for girls and for smaller children. It shows ideal playground layouts, where cost is secondary to service and it shows, too, what combinations are most desirable for smaller communities or centers where only a limited appropriation is available.

And, of course, it points out convincingly just why you should always specify Medart Playground Equipment.

Add this elaborate book to your library—it is an actual help to anyone interested in Playgrounds and Playground Planning. Sent promptly on request.

FRED MEDART MFG. CO.

Potomac & De Kalb,

St. Louis, Mo.

New York

San Francisco

52 Vanderbilt Ave.

Rialto Bldg.

Chicago, 326 W. Madison St.



It will interest you to know that —

The right of a citizen to inspect municipal business, including records and data, has been upheld by the courts in the recent contest between the San Francisco Bureau of Governmental Research and the city of San Francisco.

In 1917, the Bureau wished to make an independent study of the Hetch-Hetchy project. Informal and formal requests for access to certain information relative to diamond drill borings, dam location plans, cost estimates, etc., were denied by the Chief Engineer. This position was supported by the Mayor and the Board of Supervisors. Suits were filed, one by the Bureau and one by the Secretary of the Bureau as a taxpayer.

The right of access was established by the decision, which orders that there shall be included within the writ of mandate for citizen inspection all preliminary estimates and details which form uncompleted data, even though such matters may not have been formally dignified by official sanction as public records; and further, that citizen inspection of records and "other matters" cannot be prevented on the ground that they are "confidential" by the circumstance of the City Engineer's having communicated them to the City Attorney.

Kenosha, Wis., adopted the city manager plan at the January election. The council, of five members elected at large for a term of two years, will choose the city manager for an indefinite term. Kenosha is the first city in Wisconsin to adopt this form of municipal government.

The municipal government of Paris, France, is seriously considering the possibilities of installing moving sidewalks. Prizes have been offered for the best designs, the competition being open until September 20 of this year. The greatest freedom is given contestants, though it is understood that it would be most desirable to have the proposed sidewalks underground, rather than on the surface. It is believed possible that

some form of moving sidewalk can be designed with frequent stations through those sections now most congested with foot traffic, and giving transportation at a rate of about 10 miles an hour.

The City Planning Commission of Asheville, N. C., is undertaking the preparation of a comprehensive city plan. This will include a planning survey, general city plans and report covering: main streets and roads, with typical street sections, giving their width and subdivision; right of way for railroads and locations for stations; parks, playgrounds and other open spaces, with location, use and general character of development proposed; approximate locations of districts or zones for various classes of development with proposed restrictions; and locations for the principal public buildings.

The Montclair, N. J., Board of Health has extended the work of its laboratory to include the Wasserman reaction. This work will be under the direction of Helen G. Jacobs, B. S., who has recently been studying the technique of the test at the research laboratories of the New York City Health Department under the direction of Dr. William H. Park and Miss M. A. Wilson.

Hightstown, N. J., is making preparations for a comprehensive town plan, including studies in street extension, widening and improvement, zoning, parks and playgrounds, location of public buildings, and street tree survey. The work is being financed jointly by the town, the Board of Trade, and the Peddie Institute, a private school for boys, located in the community.

The New York *Times* states:

"Mayor Frank Pulver, of St. Petersburg, Fla., had a request from the St. Petersburg Purity League that he appoint a bathing suit inspector, a formal communication from the organization stating that the league 'intends to protect the married men from the wiles of the sea vamp.'"



— so Los Angeles Bought Four More

807 Police
and Sheriff
Departments
in the U.S.
and Canada
now use
Harley-
Davidsons

For years, motorcycles have been profitable and efficient members of Los Angeles County's splendid police department. But the Harley-Davidson did not join the force until early last Fall, when ten 1922 machines began to run down "motorized crooks," chase speeders and hurry relief and emergency calls.

So successful were these ten that on November 22, the Los Angeles County Police Department *bought four more Harley-Davidsons!*

Hundreds of cities, towns and counties find the Harley-Davidson not only indispensable, but a real profit-maker. It soon pays for itself by the additional revenue it earns for the police department, and its famed durability and economy of operation make it a profitable investment that lasts for years.

Ask your local dealer for free demonstration of the 1922 Harley-Davidson. Get the new, lower prices, and write us for special, illustrated literature on police use of motorcycles in many American cities. No obligation to you.

HARLEY-DAVIDSON MOTOR CO.
MILWAUKEE, WISCONSIN

Harley-Davidson

World's Champion Motorcycle

Hope for the City Jobless

By R. L. Foster

Major, Quartermaster Corps, U. S. Army; Publicity Director, The President's Conference on Unemployment

“THE problem of meeting the emergency of unemployment is primarily a community problem. The responsibility for leadership is with the mayor and should be immediately assumed by him.”

This, in a paragraph, is the sum and substance of one of the most important recommendations of the President's Conference on Unemployment, to meet a nation-wide emergency. How well that emergency has been met can best be determined to-day by the reports from the various municipalities which have found themselves confronted with the serious situation of joblessness and business stagnation, and the more poignant one of acute suffering and bitter distress.

The Conference is concerned mostly with methods. Thinking persons did not expect the nation's unemployed to be restored to a job in some miraculous fashion, but one big thing was accomplished—the Conference did stimulate a sense of community responsibility of such nation-wide proportions that to-day there are hundreds of cities and towns in every state in the Union reporting to the working committee in Washington. They tell that they have the situation in hand, either by having an organization to meet it or by so speeding up business and industry as to provide some sort of employment for every man to whom joblessness might mean hunger and cold, or worse.

The peak in unemployment is ordinarily reached in mid-winter. The President's Conference took time by the forelock and spurred on the more sizeable communities to a full realization of the task ahead of them. It recommended:

“The basis of organization should be an Emergency Committee representing the various elements in the community. This committee should develop and carry through a community plan for meeting the emergency, using existing agencies and local groups as far as practicable. One immediate step should be to coordinate and establish efficient public employment agencies and to register all those desiring work. It should coordinate the work of the various charitable institutions. Registration for relief should be entirely separate from that for employment.”

To-day we find that the average municipality is accordingly prepared for this work, because it visualized ahead of time the problem of finding work for idle but willing hands to do. The President's Conference on Unemployment is responsible for this preparation. To the cities of the country must go the praise and credit for the accomplishment.

In a general way their achievements are something to be proud of. There are exceptions, but the far greater majority did something—they sold municipal bonds and speeded up public work; they organized workmanlike committees headed by the mayor, and created jobs for the jobless; they helped local industries by staging sales of home-made products; they set projects going in winter which are generally put off until spring or summer; they raised substantial sums to buy meat and groceries, to pay the rent, to bring medical care, to put shoes on children's feet, to furnish shawls and overcoats and woolen socks.

As a result, the progressive cities of the United States are to-day in a position of readiness to take full advantage of the opportunities which will soon be theirs in the improved order of things, and at the same time they have demonstrated in the best possible manner their concern for the unemployment of the home town folks.

Referring again to the recommendations of the Conference, the cities united in agreeing that the relief of unemployment was a local problem; that it must be borne by local authorities and citizens. From Washington came the news to all of them that the Conference had originated a clearing-house for the exchange of information, while it urged the commencement of public projects, no matter how tight the money market or severe the winter weather.

And the cities have “come across.” There are still thousands of unemployed, but their army would have been greater had the Conference never been held. Those who criticize its work because we have not reached a Utopian world, where everybody has pre-

The 12 Hour Underwriters' Test--How Made and Why

The machine to be tested by the Underwriters' Engineer is required to pump continuously throughout the twelve hours. It must deliver its rated capacity in gallons against 120 pounds net pump pressure for six hours; half its rated capacity against 200 lbs. pressure for three hours and one-third against 250 lbs. for three hours. *Tests must be made drafting water.*

These tests are made to protect the purchasers of fire trucks against unreliable and over-rated pumps, and to establish the value of a type. All future machines of the same make and type will be approved by passing a three hour test.



The Pump That Made This Success

The Reo-Northern pictured passed the 12-hour Underwriters' test at 300 gallons' capacity and at the close of the 12-hour test, without stopping, delivered 344 gallons against 122 lbs. pressure for an additional 30-minute run. This established the Reo-Northern in the *approved class*. The Underwriters must give credit for Reo-Northern installations proportionate to its rated capacity—They wrote the specifications of the test, they made this test, they gave out the figures.

The Reo-Northern is a decidedly practical and effective fire truck for outlying districts of even our largest cities, as well as for smaller communities.



NORTHERN
FIRE APPARATUS CO.
MINNEAPOLIS, MINNESOTA. U.S.A.

cisely the job he yearns for, may well pause to consider the immeasurably greater wretchedness and idleness we should be experiencing now had there been no Conference.

Its delegates did not do away with hard times by the mere waving of a wand, nor did they point the way to perfect prosperity at a high and lovely level. But they did relieve a lot of men and women who wanted a job—any kind of job—who would be roaming the streets to-day and half starving through the winter, if the Conference had not been held. Let us see how some of the cities have set about solving their own peculiar problems.

Creating Jobs

An "Odd Job Campaign" has seemed to many to be one of the sure-fire schemes. How were these desirable jobs created? For example, here are some city reports to Colonel Arthur Woods, Chairman of the Emergency Committee of the Conference:

Chicago has made a house-to-house canvass under the direction of the 23 battalion fire chiefs, to compel householders to remove from their premises all combustible material and refuse, as a fire prevention measure. This campaign has created many short-time jobs. The Women's City Club has divided the city into 35 districts, each in charge of a woman chairman, who devotes specified hours each day to getting jobs through its membership.

Dallas, Texas, took a church census of its 190,000 population, and each householder was asked if some special odd job—painting, carpentry, gardening, or cleaning—could be furnished the unemployed. A record was kept of the replies and addresses, with the result that a large number of days of work were secured for the most needy.

Kearny, N. J., has an agent out every afternoon, covering the town with several helpers, in automobiles. They visit buildings under construction, look over streets being paved, and call at all industrial plants and railroad shops, offering the cooperation of the local employment bureau, and ascertaining exactly what kind of help is needed.

Each ward in Rockford, Ill., has a committee with the two aldermen as chairmen. These committees in turn have organized precinct committees with a member in charge of each city block. Personal contact like this has resulted in a very successful

campaign to provide jobs and relieve distress.

Fort Smith, Ark., has a rock-pile where men break big stones into little ones, to be mixed with cement and sand to improve the local streets. Gloucester, Mass., and Evanston, Ill., pay the jobless to chop down condemned city timber, which is sold for fuel.

Youngstown, Ohio, has sold municipal bonds and provides work in the city parks for men with families. They are divided into two groups, and work in two-week shifts. The election officials lent their machinery, and a day was set apart for the registration of the unemployed. Allentown, Pa., is continuing all public work regardless of weather conditions, and a special drive has been made to remodel store fronts in order to give work to builders. A "Cheap Homes Campaign" has also stimulated employment and solved the housing problem.

Pittsfield, Mass., has a "flying shovel squadron" which reports immediately to any citizen who telephones, and clears the snow from his sidewalk in a jiffy.

This is one way.

Bringing Man and Job Together

A second grouping of cities has succeeded by matching up the man and the job, with the least possible friction and delay.

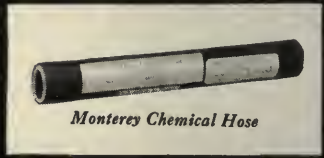
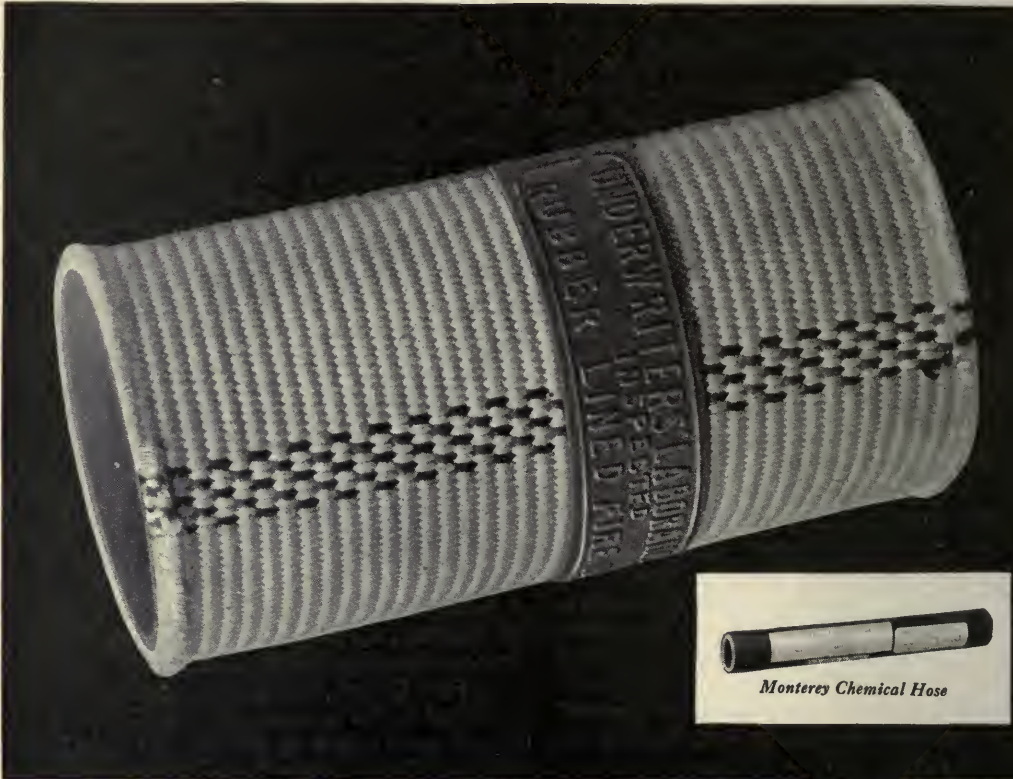
In Fort Wayne, Ind., advertisements were published in the newspapers, and the unemployed were asked to fill out and send in blanks. These were turned over to the local employment agency, and local industries secured the help they needed.

Schenectady, N. Y., has taken care of its own problem by bond issues for public improvements, and the city officials are enforcing rigidly such ordinances as snow removal, which is done under city supervision and charged on tax bills of all derelict property owners.

Atlanta, Ga., has formed a club of 500 citizens, each of whom has pledged the building of a dwelling to be rented at a reasonable figure, thus giving employment to many, and also helping the housing situation.

Boston, Mass., has asked all employers to increase the number of their employees by at least one, and as many more as is possible. New London, Conn., runs special entertainments in the theaters with local talent. The unemployed are allowed to sell tickets and retain a good percentage of the proceeds. Civil service rules are suspended in Cam-

GOODYEAR



Monterey Chemical Hose

Single Jacket Underwriters Fire Hose

Copyright 1922, by The Goodyear Tire & Rubber Co., Inc.

Goodyear Single Jacket Fire Hose bears two marks that prove its high quality—the Underwriters' label and the name of Goodyear. In many communities it can be used efficiently instead of more expensive, heavier, double-jacket hose.

Goodyear Monterey Chemical Hose also carries the Underwriters' approval—a guarantee

that this hose will withstand definite pressures and resist effectively the action of acids. Its design and the materials of which it is made insure long, satisfactory wear.

Goodyear builds other types of hose for municipal needs. For detailed information about any of them, write to Goodyear, Akron, Ohio, or Los Angeles, California.

Goodyear's complete line of tires for fire apparatus and other trucks includes a type for every need. For straight chemical or hose, combination chemical and hose, triple combination and ladder trucks, operating over wide areas, we recommend Goodyear Cord Pneumatics. The same apparatus, operated in smaller areas, over hard roads only, should use either



Goodyear Cords or Goodyear Cushions. The SC Cushion is a pressed-on tire especially good for such use. For heavy pumpers, tractors and aerial trucks, which seldom leave hard pavement, we suggest Goodyear All-Weather Tread Solids. Tell us your trucking conditions and we will gladly specify the most efficient tires for your work.

bridge, Mass., so that many persons may rotate in the same jobs.

Houston, Texas, maintains a gang of laborers ranging in number from 200 to 600, paying them \$1.25 per day and, if they have dependents, supplementing this by charity. Employers are urged to apply to the city for labor, which is supplied from this gang.

Public-spirited citizens in Rock Island, Ill., have banded together to hire one man one day a week to keep him from becoming an object of charity. In Erie, Pa., a drive has been made to push the sale of "Erie-made" products, in order to provide local employment. Lima, Ohio, has put 100 men to work two or three days a week, paying them in orders on grocery stores for food. Butte, Mont., raises \$60,000 each month, and extends some sort of aid to 2,500 families. Unemployed single men can get two meals a day of beef stew, vegetables, bread and butter, and coffee, out of this fund. Galesburg, Ill., has put \$100,000 into water-mains, and work has gone on right through the winter, while the town provides lodging and food for the destitute.

Fort Dodge, Iowa, reports that jobless miners are working abandoned coal mines in the vicinity, which has given them a living and reduced the price of coal at the same time. Red Oak, Iowa, has opened a stone quarry and hauls the rock to the locations where it will be used in the spring.

Salt Lake City, Utah, has established a municipal wood-yard, where old railroad ties and discarded telephone and electric light poles are sawed into firewood by the unemployed, at 25 cents an hour. They are paid in lodging and meal tickets, and the kindling is sold.

Funds for Relief

A third grouping includes those cities which have appropriated funds, in addition to the regular budget, to relieve distress and suffering.

New Haven, Conn., is raising a community chest of \$500,000, which includes an item of \$50,000 for an emergency fund for the unemployed. In Hartford, Conn., small sums are advanced to unemployed persons on their notes in favor of the city for repayment. This keeps borrowers from being put on the pauper list and jobless workers retain their self-respect.

Indianapolis has had an audit of city funds, and, with \$163,000 available, has

commenced work on parks and streets, with a constantly increasing pay-roll of deserving men, which now aggregates 1,200. In addition, \$120,000 was raised in four hours for the relief of the unemployed.

Cleveland's community chest organization raised its quota of \$3,500,000 in one week, and it reports that enough more will be forthcoming to prevent extensive suffering in the present emergency. In Cincinnati, the City Council has appropriated \$10,000 for the Mayor's Unemployment Committee.

The Finance Committee of the Chamber of Commerce, Poughkeepsie, N. Y., will lend up to \$100 to any unemployed man of reputable character, and accept his note for 90 days at reasonable interest charged to make up for any loss which may occur through failure to pay.

The City Council of Racine, Wis., has turned over \$50,000 from its general fund to the central association for the needy, sick and unemployed. Applicants sign notes and are expected to repay when they get a job.

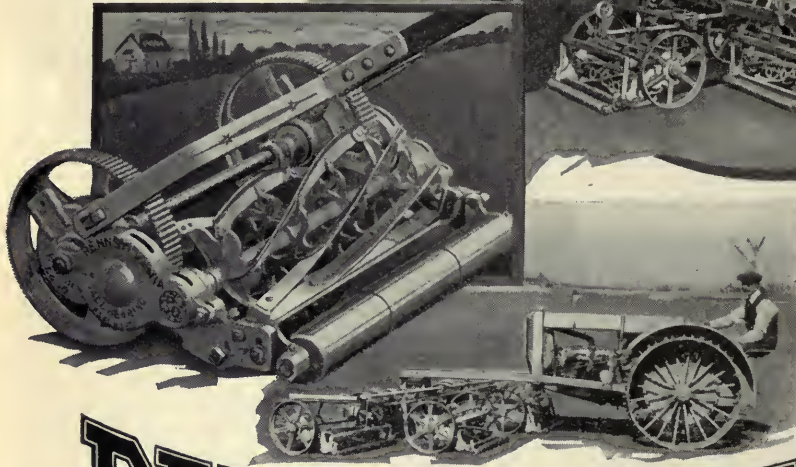
Buffalo has set aside \$70,000 for groceries and other necessities for the relief of 1,113 families. Detroit is lending out of emergency funds \$1,750,000 as necessity arises to applicants for relief, some of whom return it in work performed for the city. Kansas City has raised \$290,000 in a charity drive. Boise, Ida., has opened a municipal wood-yard, where wages are not as high as the scale, but grocers have pledged themselves to supply food at cost to men who take this work, thereby making the money earned approximate the regular wage.

St. Paul, under an emergency clause in its charter, is authorized to borrow \$100,000 to give employment to men with families, for sewer building, bridge repair, and snow removal. Other cities which have made appropriations for public works, because of the emergency, are: Los Angeles, Calif., \$2,000,000; Savannah, Ga., \$300,000; Baltimore, Md., \$250,000; Dayton, Ohio, \$500,000; Hazleton, Pa., \$250,000.

With the Conference linking up the numerous municipalities in a nation-wide effort to combat idleness and relieve distress, with the municipalities backing the movement with patriotism, initiative, and full knowledge of conditions, is it not fair to assume that before many months have gone by, unemployment and its twin brother, unrest, will seem like a bad dream?

Pennsylvania TRIO; a time and labor saver for golf course, parks, large estates 86 in. swath.

Pennsylvania GOLF; closest cutting for putting greens, tennis courts and fine lawns.



Five Pennsylvania Quality Mowers driven by tractor will cut 60 to 80 acres per day.

PENNSYLVANIA QUALITY LAWN MOWERS

NO MATTER what kind of a job they have been put up against, Pennsylvania Quality Mowers have more than met every requirement.

Their record shows longest, most satisfactory service, least upkeep cost and greatest durability in lawn mower history.

Exclusive features, self-sharpening, crucible, tool steel blades, automobile type ball bearings, selected material and specialized manufacturing processes assure the most satisfactory and the most economical service.

Write for "Pennsylvania TRIO Book"

Pennsylvania Lawn Mower Works, Inc.

1615 North 23rd Street, Philadelphia

The City's Legal Rights and Duties

Information for City Attorneys and Other Municipal Officers, Summarizing
Important Court Decisions and Legislation

Conducted by A. L. H. Street, Attorney at Law

Ordinance Requiring Hospitals to Be Constructed of Non-Inflammable Materials Upheld Under the General Law-Making Powers of Charter

Under the charter granted by the general assembly to the city of Dublin, Ga., authority was granted to the mayor and aldermen to make and establish such rules, laws, ordinances, regulations, and orders as may to them seem right and proper, respecting all and every such matter and thing whatsoever "that may be by them considered necessary or proper or incident to the good government of said city, and to the peace, security, health, happiness, welfare, protection, or convenience of the inhabitants of said city, and for preserving the peace, good order, and dignity of said government." They were also granted therein all other powers necessary or incident to municipal government, not in conflict with any other special power or authority given said city. Held, that the powers above expressed were sufficient to authorize the mayor and aldermen to pass an ordinance prescribing that buildings to be used for hospital purposes should be constructed of brick or other non-inflammable material. (Georgia Supreme Court, *Brigham et al. vs. Mayor and Council of City of Dublin*, 108 South-eastern Reporter, 532.)

Advertising for Bids Prior to Resolution's Becoming Effective—Held Not to Make Proceeding Defective

In a case lately before the Iowa Supreme Court (*Messer v. Marsh*, 183 Northwestern Reporter, 602) it appears that the City Council at Jefferson, Iowa, adopted a resolution for the paving of certain streets. The Mayor was not present, but knew that the resolution was to be adopted and he did not veto it. Under the city's charter a resolution not signed or vetoed becomes effective at the end of 14 days. Before that period had expired, the City Clerk adver-

tised for bids, pursuant to the resolution, and it was sought by plaintiff taxpayers to enjoin performance of a contract awarded under such advertisement, on the ground that the advertising was premature. Holding that there was no jurisdictional defect in the proceedings, the Supreme Court says:

"The Council had duly adopted the resolution of necessity, and thereby gained jurisdiction to make the improvement. The Council, by a unanimous vote, had passed a resolution ordering the construction of the improvement. In the same resolution in which the Council ordered the construction of the improvement, the Council also instructed the Clerk to advertise for bids. . . . One publication of the notice for bids was made before the resolution of construction became operative, which was not more than a mere irregularity, that did not deprive the city of jurisdiction to order the improvement."

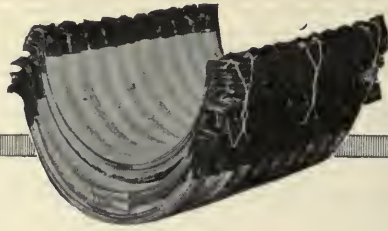
Public Utility Company and Municipality May by Agreement Reduce Rates, But Burden Is on Municipality to Show Such Agreement

Speaking concerning rights under the municipal franchise of an electric lighting and power company, the Virginia Supreme Court of Appeals said in the case of *Appalachian Power Company vs. Town of Pulaski*, 108 Southeastern Reporter, 885:

"It cannot be fairly doubted, we think, that the municipal authorities and the company could, by agreement, amend the ordinance and reduce the maximum rate thereby authorized and no further or additional consideration to the company would be needed to support such an amendment other than the continuing privilege during the term of the ordinance to conduct its business thereunder. We have, however, a statute (Code 1919, sec. 3022) which it would be necessary to pursue if it were proposed to increase the rates authorized by such a franchise, but this statute would not preclude a decrease of such rates by mutual agreement.

"The crucial inquiry in the case is whether or not section 7 of the franchise has been rescinded and the [lower] rates named in the communication of August 12, 1911, substituted therefor. This being claimed by the town, the

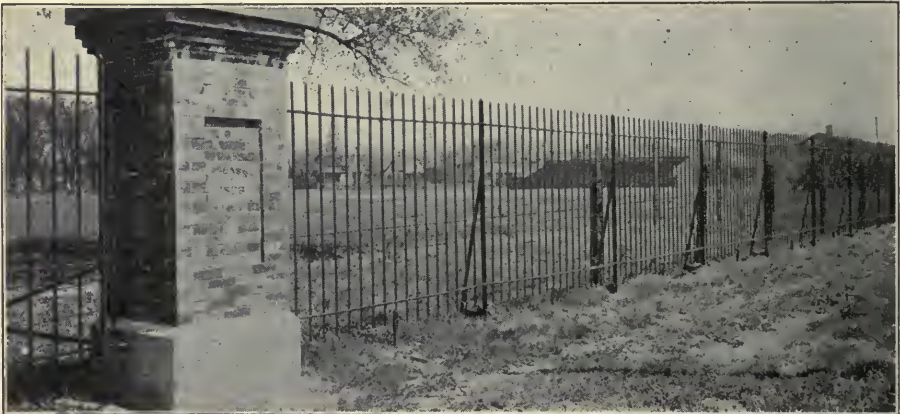
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burden is upon it to show that the franchise contract has thus been amended. Like other contracts, a franchise of this character cannot be amended without the consent of both contracting parties."

If Necessary for Purpose Primarily Intended, Proposed Authorized Bond Issue Will Not Be Enjoined Because Additional Incidental Purpose May Also Be Accomplished

A municipality will not be enjoined, at the instance of a taxpayer, from proceeding to issue bonds authorized to be issued for a given purpose (in this case to establish a water-works system) on the ground that another purpose (in this case operation of an electric light plant) will be incidentally accomplished, if the incidental object will not interfere with the accomplishment of the primary one. This was decided by the New Mexico Supreme Court in the case of *Page vs. Town of Gallup*, 191 Pacific Reporter, 460. The Court remarked:

"A municipality in its discretion may authorize its property to be used incidentally for a purpose other than that for which it is primarily purchased or constructed, if the use for incidental purposes does not interfere with the use for the primary purpose. . . . If it was true, as alleged in the answer, that the machinery which it was proposed to install was necessary for the present and reasonably anticipated needs of the town for pumping water, the fact that the town proposed to use the machinery in connection with some other municipal use could not operate to prevent the town from installing the machinery. A moment's consideration will demonstrate the unsoundness of appellee's position in this regard. It was a question of fact, of course, as to whether the machinery in question was necessary for the operation of the water plant, or whether the council in good faith had determined that it was necessary. Suppose, for example, that the court after hearing evidence had come to the conclusion that the said machinery was proper and necessary for such purpose. Would it have enjoined the town from installing it simply because the town proposed incidentally to use it in connection with some other use while not being used in pumping water? If so, then the town would be precluded from installing any kind of machinery or equipment that might be used incidentally for any other purpose."

Scope of Municipal Power to Furnish Public Service Beyond Its Boundaries

A city establishing an electric light plant was under a "duty to pay due regard to the future and provide for the probable necessities of a rapidly increasing population," holds the Utah Supreme Court in the case

of *Muir vs. Murray City*, 186 Pacific Reporter, 433. And if, acting in good faith, a city has a large surplus of current, it may legitimately run a transmission line beyond its boundaries to a near-by city and sell the surplus. But the municipality cannot defend its action in exceeding its charter powers by engaging in non-governmental enterprises on the mere ground of profit. "Cities are not organized primarily for the purpose of engaging in commercial enterprises, however profitable they may appear or even prove to be." But while "cities are not organized primarily as profit-making concerns, yet when it is incidental, as in the instant case, to a proper exercise of its legitimate powers, the making of the enterprise a profitable one was highly commendable." And the Court adds that where money is borrowed for a corporate purpose and is profitably and judiciously expended, to the benefit of the inhabitants, the city will not be permitted to defeat liability on the loan through the circumstance that the transaction may have been somewhat irregular.

Combination to Prevent Competitive Bidding is Contrary to Public Policy

"It is the settled rule of the law that arrangements and combinations among prospective bidders for municipal contracts to prevent competition among themselves, and to bring about an award at a figure which is not the result of an honest competition, are contrary to public policy and void." This observation was made by the Texas Court of Civil Appeals in the case of *City National Bank of Corpus Christi v. City of Corpus Christi*, 233 Southwestern Reporter, 375.)

City Not Liable Under Provisions of Contract Where Contract is Void by Reason of Not Being Awarded to Lowest Bidder

A contract for a street improvement being void because not awarded to the lowest bidder, as required by the municipal charter, the city cannot be held liable under a provision in the contract, to the effect that the improvement should be paid for out of a special assessment fund, but that on the city's failure to make a valid assessment it should become liable. (*Oregon Supreme Court, Montague-O'Reilly Company v. Town of Milwaukee*, 199 Pacific Reporter, 605.)

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SEWERAGE AND SEWAGE TREATMENT

Harold E. Babbitt, Professor of Municipal and Sanitary Engineering, University of Illinois. John Wiley & Sons, Inc., New York. 1922. XII + 531 pp. Tables, diagrams and illustrations. \$5.

A very thorough treatise on the subject, prepared by a teacher primarily for instruction purposes, covering the entire fields of sewerage and sewage treatment. It contains reports of tests on leaping and overflow weirs performed at the University of Illinois and not published elsewhere. The leading chapters cover the work preliminary to design, the computation of quantity of sewage, the hydraulics of sewers and design of sewerage systems and their appurtenances, pumps and pumping stations, materials for sewers, design of the sewer ring, contracts and specifications, construction and maintenance of sewers, sewerage and its disposal, with special reference to disposal by dilution, screening and sedimentation, septicization, filtration and irrigation, activated sludge, acid precipitation, lime and electricity and disinfection, the disposal of sludge, and the use of automatic dosing devices.

CONSTRUCTION COST KEEPING AND MANAGEMENT

H. P. Gillette and R. T. Dana, members American Society of Civil Engineers. McGraw-Hill Book Company, Inc., New York. 1922. First Edition. XVII + 572 pp. Charts, diagrams and illustrations. \$5.

A book intended to assist engineers, contractors and superintendents in reducing construction costs to a minimum through the science of management, cost keeping and forms. Specific chapters are devoted to the laws of management, the rules for securing minimum costs, piece rates, bonus and other systems of payment, measuring the output of workmen, cost keeping, book-keeping for small contractors, office appliances and methods, and miscellaneous cost report blanks and systems of cost keeping.

SEWERAGE AND SEWAGE DISPOSAL

Leonard Metcalf and Harrison P. Eddy, Consulting Engineers, Boston, Mass. McGraw-Hill Book Company, Inc., New York. 1922. First edition. XIV + 598 pp. Tables, diagrams and illustrations. \$5.

While not a successor to the valuable three-volume treatise, "American Sewerage Practice," published in 1914 and 1915, this book contains much later data and valuable material based on the rapid advance of sewerage treatment practice since 1914. A book most heartily to be recommended to new students of sewerage and sewage treatment processes, and a valuable reference for any municipal library.

THE COMMUNITY

Edouard C. Lindeman, Professor of Sociology, North Carolina College for Women. The Association Press, New York. 1921. 222 pp. \$1.75, postage included.

An analysis of the forces which must be reckoned with in influencing public opinion and community action. The book was written primarily to interpret the Community Movement to teachers, pastors, Y. M. C. A. and Y. W. C. A. secretaries and others interested in community leadership.

RURAL ORGANIZATION

Walter Burr, Professor of Sociology, Kansas State Agricultural College. The Macmillan Company, New York. 1921. XI + 250 pp. \$2.25.

The book considers the rural community both from the economic and the human side. It takes up in detail such subjects as farm production, marketing, finance and transportation. Under community social functions it discusses education, sanitation and health, recreation, beautification and home making.

ROAD GUIDE OF THE LINCOLN HIGHWAY

The Lincoln Highway Association National Headquarters, Detroit, Mich. 1921. Fourth Edition. 336 pp. Maps. \$2.50.

This official road guide contains a complete history of the Lincoln Highway and full information regarding mileage and places of interest along this famous transcontinental road.

THE PLAY MOVEMENT IN THE UNITED STATES

Clarence E. Rainwater, Ph.D., Assistant Professor of Sociology, University of Southern California. The University of Chicago Press, Chicago, Ill. 1922. XI + 371 pp. Illustrated. \$2.90, postage included.

The author was for a number of years Director of the Hamilton Park Recreation Center in Chicago, and later Dean of The American College of Physical Education in the same city. The volume is an analysis of the play movement in the United States, including the activities occurring in social and community centers, in community music, drama, and pageantry, and in community service and organization.

LAND DRAINAGE

W. L. Powers, M. S., and T. A. H. Teeter, B. S. John Wiley & Sons, Inc., New York. 1922. IX + 270 pp. Tables, diagrams and illustrations. \$2.75.

While this book deals with the subject of drainage primarily from the agricultural standpoint, it contains much of value to the contractor and engineer who has to do with the reclamation of arid and wet land. It is intended principally as a text-book for students of general agriculture and agricultural engineers, as a reference book for practical farmers, and as an aid to owners of wet, overflowed, marsh, swamp or alkaline land, and to contractors who would improve this type of land area.

SPECIAL LIBRARIES OF THE UNITED STATES

"Special Libraries Directory," edited by Dorsey W. Hyde, Jr., President of the Special Libraries Association. 1921. 123 pp. The libraries are listed alphabetically by name, and also geographically by states and cities. An explanatory paragraph describes the particular services each library is equipped to render. (Apply to Dorsey W. Hyde, Jr., President, Special Libraries Association, 3363 16th Street, N. W., Washington, D. C.)

BITUMINOUS PAVEMENTS

"Bituminous Pavement Investigations in Certain Texas Cities," Part II, by Roy M. Green, Manager Western Laboratories, Inc., Lincoln, Neb. Published as Bulletin No. 24, Texas Engineering Experiment Station, by the Mechanical and Agricultural College of Texas, Central Station, Tex. 1921. 120 pp. Illustrated. Discusses asphaltic concrete, sheet asphalt, Uvalde rock asphalt, and Oklahoma rock asphalt. (Apply to J. C. Nagle, Director, Texas Engineering Experiment Station, Mechanical and Agricultural College of Texas, Central Station, Tex.)

WATER PURIFICATION

"Water Purification in Iowa," by Jack J. Hinman, Jr., 8 pp. 1921. Reprinted from the Proceedings of the Thirty-third Annual Meeting of the Iowa Engineering Society, Des Moines, January, 1921. (Apply to author, State University of Iowa, Ames, Iowa.)

COUNTY HIGHWAYS IN DELAWARE

Eighth Biennial Report of the New Castle County State Highway Commissioner, of New Castle County, Delaware, for the years 1919 and 1920. 28 pp. Maps and illustrations. (Apply to Charles E. Grubb, New Castle County State Highway Commissioner, Wilmington, Del.)

SAFETY FIRST FOR THE PUBLIC.

"An Analysis of Public Accidents." Published by the National Safety Council, 168 North Michigan Ave., Chicago, Ill. 1921. 10 pp. Includes an argument for the adoption of uniform public accident report forms. (Apply to publishers.)

TUBERCULOSIS PREVENTION IN CANADA

"Twenty-first Annual Report of the Canadian Association for the Prevention of Tuberculosis," including transactions of the annual meeting held in Toronto, May 21, 1921. 139 pp. (Apply to Robert E. Wodehouse, M. D., O.B.E., Bank Street Chambers, Ottawa, Can.)

THE FEDERAL GOVERNMENT AND EDUCATION

Report of the Commissioner of Education for the year ended June 30, 1921. 42 pp. (Apply to Dr. John James Tigert, Commissioner of Education, Washington, D. C.)



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"Fighting to Make Chicago Safe for Children," by Louise de Koven Bowen. 1920. 13 pp. Account of the work of the Juvenile Protective Association of Chicago, Ill. Also the Nineteenth Annual Report of The Juvenile Protective Association of Chicago for the period from November 1, 1919, to November 1, 1920, together with synopsis of the work for 1920 and 1921. 39 pp. (Apply to Albert E. Webster, Acting Superintendent, 816 South Halsted Street, Chicago, Ill.)

PROPER FOOD FOR SCHOOL CHILDREN

"The School Lunch," by Mary Pack. Published by the Extension Service in Agriculture and Home Economics, College of Agriculture, University of Illinois, Urbana, Ill., as Circular No. 41. 1921. 23 pp. Illustrated. Applicable especially in rural districts. (Apply to author, address above.)

A SHORT COURSE IN CIVICS

"Active Citizenship—A Study Outline," prepared by Charles Davidson, Ph.D. H. W. Wilson Company, New York, N. Y. 1921. 51 pp. 50 cents. Not a text-book, but an outline designed for the use of clubs or classes. (Apply to publishers.)

CANADIAN HIGHWAYS

Annual Report of the Department of Public Highways, Ontario, 1919. 1921. 101 pp. Illustrated. Published by order of the Legislative Assembly of Ontario. (Apply to F. O. Biggs, Minister of Public Works and Highways, Toronto, Ont.)

PUBLIC HEALTH INSTITUTES IN THE UNITED STATES

Preliminary Announcement of a Series of Public Health Institutes to be held during 1921-22. Published as Official Circular V. D. No. 2 of the United States Public Health Service. 1921. 39 pp. List of cities in which such institutes will be held, together with programs. (Apply to The United States Public Health Service, 16 Seventh Street, S. W., Washington, D. C.)

SOURCES OF MUNICIPAL REVENUE

"New Sources of Revenue for New Jersey Municipalities," compiled by The Bureau of Municipal Information of the New Jersey State League of Municipalities, as Report No. 48. 31 pp. and appendix. \$1. A careful tabulation of revenues with discussion and deductions from them. Two of the tables from the appendix are reproduced elsewhere in this issue. (Apply to Sedley H. Phinney, Executive Secretary, New Jersey State League of Municipalities, 712 American Mechanic Building, Trenton, N. J.)

WATER RESOURCES OF NEW JERSEY

"Report on the Water Resources of the State and Their Development," made by Hazen, Whipple & Fuller, for the Department of Conservation and Development of the State of New Jersey, 1922. 36 pp. Maps and illustrations. A thorough and detailed survey of the population and water requirements of the New Jersey Metropolitan District and the water resources which will meet those requirements for the next fifty years. (Apply to Hazen, Whipple & Fuller, 30 East 42nd Street, New York, N. Y.)

THE FINANCES OF KANSAS CITY, MO.

"Report on a Study of the Finance and Accounting Offices of Kansas City, Mo.," prepared by the Kansas City Public Service Institute. 1922. 103 pp. The information presented and the recommendations made are the result of nearly a year's study of the organization, methods and procedure of Kansas City and other cities, largely by Ray W. Wilson, Accountant of the Institute. It offers suggestions which, it is believed, would promote economy and efficiency. (Apply to the Kansas City Public Service Institute, 715 Kansas City Life Building, Kansas City, Mo.)

STREET SANITATION CONFERENCE

Report of the Proceedings of the Second Annual Conference of the International Association of Street Sanitation Officials, held in Chicago in August, 1921. 43 pp. Illustrated. (Apply to A. M. Anderson, Secretary, 37 West Van Buren Street, Chicago, Ill.)

PROPOSED CHARTER FOR NEW YORK CITY

Home Rule Charter for the City of New York, proposed to the Charter Revision Commission by Charles L. Craig, Comptroller of the City of New York, 1922. 29 pp. (Apply to Charles L. Craig, Comptroller, New York, N. Y.)

NEW JERSEY SEWAGE WORKS ASSOCIATION

Proceedings of the Sixth Annual Meeting of the New Jersey Sewage Works Association, held in Trenton, February, 1921. 24 pp. (Apply to Myron E. Fuller, Secretary-Treasurer, 170 Broadway, New York City.)

HOUSING CONDITIONS IN WINNIPEG

"Report on Housing Survey of Certain Selected Areas," made in March and April, 1921, by Ernest W. J. Hague, Assistant Chief Health Inspector, 1921. 101 pp. Illustrated. Also the "Report on a Survey of Vacant Houses in the City," made in January, 1922. 11 pp. (Apply to Dr. A. J. Douglas, Health Officer, Winnipeg, Manitoba, Can.)

AMERICAN LIBRARY ASSOCIATION CONFERENCE

Papers and Proceedings of the Forty-third Annual Meeting of the American Library Association, held in Swampscott, Mass., June, 1921. Published as the July number of the Bulletin of the American Library Association. 260 pp. Free to members. (Apply to Carl H. Millam, Secretary, American Library Association, 78 East Washington Street, Chicago, Ill.)

EDUCATION BUDGET FOR DETROIT

"An Analysis of the 1922-23 Budget Requirements of the Board of Education, City of Detroit," by Arthur B. Moehlman, J. F. Thomas and H. W. Anderson. Published as the February, 1922, number of The Detroit Educational Bulletin. 64 pp. Illustrated. (Apply to The Detroit Educational Bulletin, Board of Education, Detroit, Mich.)

RURAL SANITATION

"Sanitation and Sewage Disposal for Farmsteads and Country Estates," by William Paul Gerhard, O. E., Dr. Eng., Member American Public Health Association, 1922. 12 pp. 30 cents. (Apply to author, 17 West 42nd Street, New York, N. Y.)

HEALTH SURVEY OF LAFAYETTE, IND.

"Public Health Survey of Lafayette, Ind., and Tippecanoe County, Ind.," by Murray P. Horwood, Ph.D. Chapter I, "Water Supply," 1921. 23 pp. Illustrated. Published by the Tippecanoe County Tuberculosis Association, Lafayette, Ind. (Apply to publishers.)

CHARTER REVISION IN NEW YORK

"The New York City Charter—Report on Charter Revision," prepared by the City Club of New York, for submission to the New York Charter Commission, 1921. 40 pp. (Apply to Raymond V. Ingersoll, Secretary, City Club, 55 West 44th Street, New York, N. Y.)

FOREST FIRES IN NORTH CAROLINA

"Forest Fires in North Carolina during 1918, 1919, and 1920, and Forest Protection in North Carolina," by J. S. Holmes, State Forester. Published as Economic Paper No. 51, North Carolina Geological and Economic Survey, 1921. 82 pp. Illustrated. (Apply to Joseph Hyde Pratt, North Carolina Geological and Economic Survey, Raleigh, N. C.)

MINNESOTA STATE FIRE DEPARTMENT ASSOCIATION

"Proceedings of the Forty-Ninth Annual Convention of the Minnesota State Fire Department Association," held at International Falls, Minn., June, 1921. (Apply to Chief John A. Gross, Secretary, Red Wing, Minn.)

PUBLIC MARKETS

"Open Types of Public Markets," by McFall Kerbey. Published as Bulletin No. 1002, United States Department of Agriculture, 1921. 18 pp. Illustrated. (Apply to Bureau of Markets and Crop Estimates, United States Department of Agriculture, Washington, D. C.)

SHIPPING WATER SAMPLES

"A New Water Sample Shipping Case," with some observations on the changes that take place in stored samples of water, by R. R. Spencer, Assistant Surgeon, and H. P. Letton, Sanitary Engineer, United States Public Health Service. Reprint No. 425, Public Health Reports. 8 pp. Illustrated. (Apply to the United States Public Health Service, Washington, D. C.)

FIRE PREVENTION IN DETROIT

Report of the Fire Prevention Committee of the Detroit Board of Commerce on Fire Prevention Week, October 2-9, 1921. (Apply to J. Robbins, Secretary, Fire Prevention Committee, Detroit Board of Commerce, Detroit, Mich.)

OHIO STATE FIRE MARSHAL'S BULLETIN

Official Bulletin, Ohio State Fire Marshal's Department, October, 1921. 32 pp. (Apply to H. A. Dykeman, State Fire Marshal, Wyandotte Building, Columbus, Ohio.)

BIBLIOGRAPHY OF CHILD HEALTH

Books on Health, as related to the School Child. Second Edition, Revised. Bibliography Bulletin 69, New York State Library. Published by the University of the State of New York. 1921. 37 pp. (Apply to James I. Wyer, Ph. D., Director of the State Library, Albany, N. Y.)



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Waterproofed Cement for Outdoor Swimming Pools

The construction of swimming pools by various communities has become one of the most interesting studies among engineers and municipal officials. One of the chief problems encountered is building a pool which will be water-tight, white, and will not stain.

The use of Medusa waterproofed white Portland cement, manufactured by the Sandusky Cement Company, 626 Engineers Building, Cleveland, Ohio, has overcome these difficulties in a number of pools. There are two outdoor pools where the use of this cement has been particularly notable. Both have plaster coats over a reinforced gray Portland cement base, one using the plain white cement and the other the waterproofed cement.

The outdoor pool at Riverside Park, near Springfield, Mass., is of the saucer type, built with reinforced concrete, and is some 300 feet in diameter. A finish plaster coat of Medusa plain white cement, white bank sand and hydrated lime was used. This pool has been in use about six years, and the white cement finish has withstood the severe weather of that part of the country, frequently reaching far below the zero mark; but in this case the cement has become discolored through the absorption of vegetable matter contained in the water of the Connecticut River, although the hydrated lime was supposed to make it impervious. If Medusa white waterproofed cement had been used in this work, at a cost of about \$90 additional, this cause of discoloration by water coming up from beneath would have been overcome.

Another swimming pool which represents about the best in pool construction to-day is an

outdoor pool, 60 x 40 feet, on the Henry Phipps estate, Westbury, L. I. This pool was built of concrete with a finished plaster coat of Medusa waterproofed white Portland cement and white crushed marble in a 1 to 2 mix. After the forms were stripped and the surface roughened, the plaster was applied in thin coats until a thickness of 1 inch was reached for the side walls. The floor was laid in one operation at a thickness of 2 inches. Expansion joints were placed perpendicularly on the side walls and across the floors, 10 feet on centers to a depth of ½-inch on walls and 1 inch in the floors. After three days, when the plaster had become sufficiently hardened, the entire surface was gone over carefully with a fine carborundum stone, sufficiently to remove the trowel marks, and then brush-coated with clear cement. This cement coating was allowed to remain until the operation was about completed, at which time it was again gone over with a fine carborundum stone with plenty of clean water, until a perfectly smooth surface was reached. This pool is very pleasing in appearance, and, after five years, resembles white marble.

The above operation may at first thought appear expensive. The first stone rubbing is the most costly, but when done at the proper time a square yard can be rubbed by hand in ten minutes. In the finish rubbing it is only necessary to remove the cement film to bring up a smooth surface. Most of this can be done by machine on good-sized operations.

Medusa waterproofed white Portland cement has been tested by the Y. M. C. A. Construction Department of New York City for absorption and discoloration from the body oils, and after three weeks' tryout at the indoor pool at 58th Street and 8th Avenue, New York City, it was pronounced a success.



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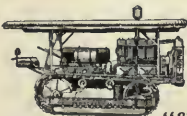
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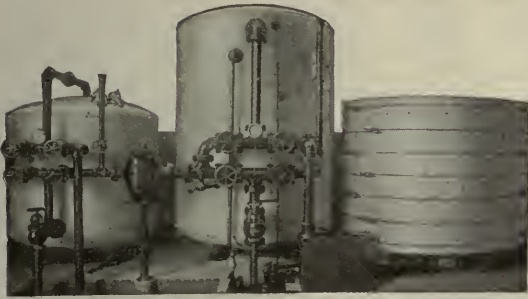
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The softening of municipal drinking-water supplies is receiving the attention of many cities and towns where reduction in the hardness of water is proving to be an economic and industrial necessity. For the solution of such problems, the Permutit Company, 440 Fourth Avenue, New York City, has had on the American market for a number of years its zeolite method of automatically softening water by extracting all of the hardness from the water without the addition of chemicals or the application of heat. A zeolite is a sodium aluminum silicate compound which possesses the remarkable property of exchanging its sodium for lime or magnesia when these elements come in contact with it in the form of hardness in water. Some of the properties of zeolite have been known to science for many years, but the first important advance was made by Dr. Robert Gans, who produced a stable artificial zeolite of high exchange value, and an apparatus for its practical use, thus paving the way for rapid commercial development.

Zeolite water-softeners are made in pressure and gravity types constructed with steel, concrete or wooden shells. Water to be softened flows slowly through the tank downward, its hardness being automatically removed. When the zeolite material needs renewing, all that is necessary is to flush it with a salt solution and then back-wash with some of the softened water. Then the material is as good as new.

Economic and satisfactory power-plant operation demands that boilers be fed with water that is free from all scale, sludge and mud-forming impurities. For the prevention of scale, the Permutit Company offers a water-softening equipment of the zeolite type which is in use in several thousands of power-plants to-day and is effectively preventing the formation of any scale whatsoever. The complete removal of all scale-forming impurities from boiler feed water before it enters the boiler is the logical correct way to

keep the boiler-heating surfaces clean. Simplicity, ease of operation and sure results are necessary, and are provided by this method. Sludge and mud-forming impurities can best be removed from boiler feed water by correct filtration.

Permutit water rectification apparatus is also made for the removal of iron and manganese, oil, excess chlorine and ammonia.

New Engineering Firm

Under the firm name of Hudson & Myron, Engineers, Messrs. Leo Hudson and John P. Myron have formed a partnership for the practice of engineering, with offices at 808-810 Wabash Building, Pittsburgh, Pa. Mr. Hudson has been in private practice for the last fifteen years, principally in water-works, sewerage, power-plants, valuations and rates. Mr. Myron, until recently, was connected with the Pittsburgh Filter and Engineering Company.

Price With Kirkgasser

It has been announced that H. B. Price, formerly Advertising Manager of the Belden Manufacturing Company, Chicago, Ill., who has been connected with that company for several years in various engineering, production and sales capacities, has resigned and joined the advertising agency of George J. Kirkgasser & Company. Mr. Price will specialize in electrical and technical advertising, and in addition to an engineering education brings to his new work a wide practical experience in engineering, construction, sales and operation.



TYPICAL 24-HOUR BOILER FEED-WATER SOFTENING PLANT

TIFFIN

Street Flushers and Trucks

MORE MACHINES IN USE THAN ANY OTHER MAKE, BECAUSE THEY GET RESULTS. REAL MERIT ALWAYS COUNTS..... ASK FOR CATALOGS. THE TIFFIN WAGON CO., TIFFIN, O.



Makers, also, of Tiffin Motor Trucks, Farm and Dump wagons, and Municipal Vehicles.

Have Good Streets Cheap All Year' Round

Avery One-Man "Road-Razer" is the fastest, most satisfactory and economical machine made for keeping roads and streets good. One man and this machine can keep many miles of city streets in good condition the year 'round. Also solves the snow problem.

It shaves the roughest, ruttiest dirt streets in a few minutes' time. On rock and gravel roads, the scarifier attachment loosens up the surface and the "Road-Razer" blade shaves it down to a hard, smooth surface leaving the road better than new.

No other machine like it—a self-contained



unit—blades and power in one machine. Turns in its own tracks in three seconds. Backs up instantly. Has wide, flexible, three section 12-foot blade that fits or shapes any curve or crown of the street. Equipped with powerful six-cylinder motor.

Sold on approval, subject to demonstration. Strongly guaranteed. Saves money for tax payers and solves the problem of road and street officials, the country over. Write to-day for prices and complete information.

AVERY

Road Building and Road Maintenance Machinery

AVERY COMPANY

223 Iowa St.

Peoria, Ill.

A Pneumatic Tire That Ruts Do Not Harm

Ruts need have no menace for the life of cord truck tires now that Goodyear has perfected and is marketing a "rut-proof" cord pneumatic truck tire.

Spectacular proof that this tire is practicable was afforded by a test in which these tires on a Goodyear Heights bus were run against the curbing for 500 miles. At the end of the test the sidewalls were not worn through. Ordinary pneumatic truck tires were worn through the sidewalls in less than five miles when run against the curb.

The Goodyear "rust-proof" pneumatic truck tire is the result of objections to the use of pneumatic truck tires in some rural districts because of the premature wear of sidewalls, resulting from the contact of these large tires with the frozen ruts of winter and the sun-baked ruts of summer. This became more prominent as the use of motor trucks increased for inter-city hauling over unimproved highways, and Goodyear engineers immediately started a thorough investigation of these conditions so as to make pneumatic truck tires more efficient for this class of service.

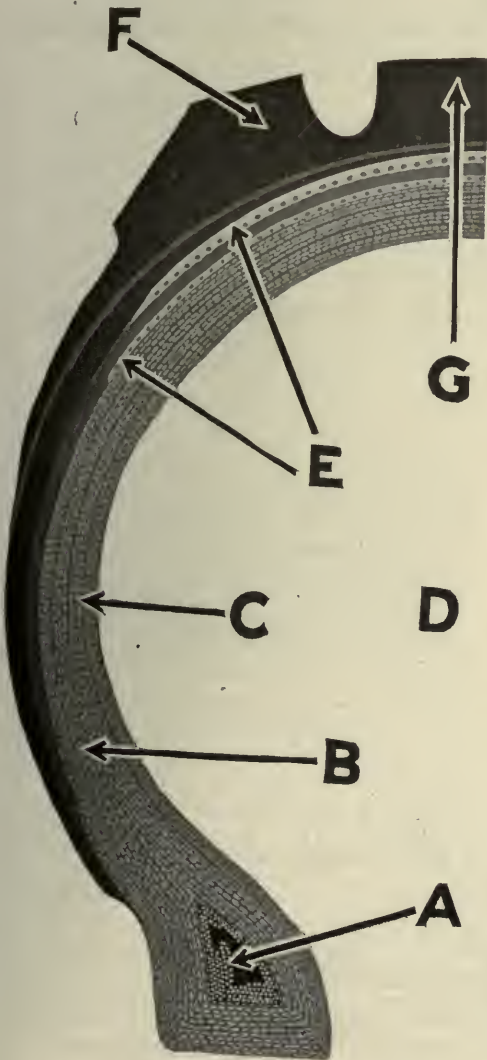
The engineers picked for development work a section of Ohio in and around New Philadelphia where there were a large number of pneumatic-tired trucks engaged in hauling coal. This particular section of Ohio seems to be a little backward in the improvement of highways, and road conditions were very severe during the fall, winter and spring months, as the dirt and clay roads would get soft with the heavy rains and then freeze with the cold weather. Ruts ran from 6 to 12 inches deep, so that if pneumatic-tired trucks traveled over the roads, the tires were running on the edge of the frozen ruts, constantly wearing away the sidewalls.

The engineers developed a tire with a specially compounded sidewall much thicker than the sidewall used on regular pneumatic truck tires, and put a number of these tires into use on these coal trucks. The results were declared to be very gratifying, and the idea was constantly improved, resulting in the Goodyear "Rut-Proof" cord pneumatic truck tires for use on trucks which are forced to use unimproved highways.

Tubular Steel Flag Poles

Many artistically executed flagpole monuments have lately been erected by leading architects who, no longer handicapped by the insufficiencies of the wooden pole, have used its successor, the tubular steel pole, for this purpose. This product appeared about 1900 in New York and was taken up as an exclusive specialty by the Pole & Tube Works, Inc., of Newark, N. J. The first few poles proving unduly expensive, a special hydraulic swaging machine capable of handling all sizes of steel pipe from 18 inches to 2 feet in diameter, was built. In this manner tubular poles are produced so nearly resembling the time-honored wood poles as to be almost indistinguishable in appearance, and of such construction as to remain permanently air-tight.

Under the constant vibration and occasionally severe deflections during hurricanes, none but the best-designed joint will remain tight; lead caulking will "creep"; pins or screws will loosen and open the way for moisture to attack the broken paint film. The appearance of a jointed tubular pole depends on the greatest number of least visible reductions to effect the taper—the greater the taper the better. The well-known tubular steel poles are second to the "continuous taper welded" type, which has been chosen by fastidious architects for monumental purposes, as shown in the photograph of the monument at Duluth, Minn., of which Cass



SECTION OF NEW PNEUMATIC TIRE

A—The Bead, B—Sidewall, C—Plies, D—Air Volume, E—Breaker Strip, F—Tread, G—The Cure.

How to select the right machine for your road work

Machinery plays such a large part in the work of building and maintaining public highways, that it is important to select machines that will give the most satisfactory service. Here are a few suggestions:

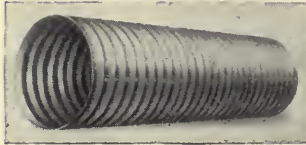
First. Buy from a reliable, well-established concern that has the will and the organization to treat you right and to furnish service.

Second. Buy a machine that will stand up under all conditions. The machine that *lasts* is the one that is profitable to use.

Third. Don't be too much concerned about price. Get your money's worth, but above all, get a good, serviceable machine.



Monarch Pressure Oil Distributor. Furnished either in the horse-drawn type or for mounting on motor trucks.



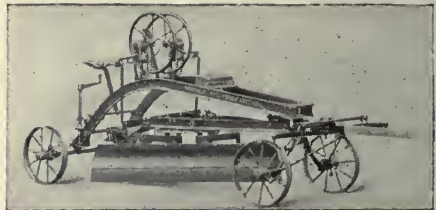
Keystone Corrugated Metal Culvert Pipe. Furnished in diameters from 8 to 72 inches any length desired. Guaranteed 25 years.



The Monarch Steam Road Roller with Steam Pressure Scarifier. A durable and dependable 3-wheeled 10-ton roller.



Champion Steel Rock Crusher. Mounted with Elevator, Screen and Portable Stone Bin. Made in several sizes, 15 to 300 tons daily.



The Winner Highway Patrol Road Grader, made in six different sizes. A one-man, two-horse machine for maintaining dirt and gravel roads. Weight 1150 pounds. Blade 6 feet long.

*Ask for our new catalog
"Everything for the Roadmaker"*

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The
**GOOD ROADS
MACHINERY CO.**
INC.

KENNETT SQUARE

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JOHN MEEHAN & SON
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PINE MOUNTAIN GRANITE Co.
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ROCKPORT GRANITE Co.
31 State Street
Boston, Massachusetts

13 Park Row
New York, New York

ROBERTS HARBOR GRANITE COMPANY

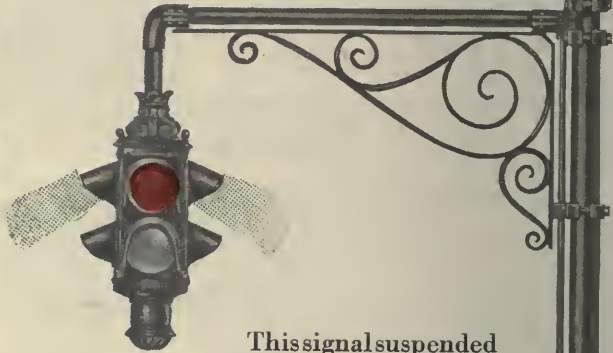
Care of Booth Brothers
208 Broadway, New York

SALISBURY GRANITE Co.
Salisbury, North Carolina

STONE MOUNTAIN GRANITE Co.
Stone Mountain, Georgia



This signal placed in roadway at street intersection.



This signal suspended from trolley pole on curb line. No street obstruction.

Both of the types of signals illustrated control traffic in four directions.

FEDERAL
TRAFFIC SIGNAL

"Bring Your Traffic Problems to Us"

Federal Signal Company

ALBANY, N. Y.



TUBULAR STEEL FLAGPOLE AT DULUTH,
MINNESOTA

Gilbert of New York is the architect. Another monument of this type, designed by Henry Bacon, New York architect, was recently dedicated at Naugatuck, Conn. This 110-foot pole is novel in so far as it is bronze-jacketed throughout its entire height of 88 feet above the bronze socle. The jacket was spirally wound under great tension, over the steel pipe, and seam-soldered, and will remain a permanent protection. Harmonizing with the bronze ornamentation, it presents an appearance of great beauty.

A Meter with Breakable Cast Iron Frost Bottom

The Buffalo Meter Company, 2917 Main

Street, Buffalo, N. Y., has been manufacturing disc water meters exclusively for 30 years, and its American meter in the present form was first placed on the market 18 years ago. To meet the demand of numerous water-works superintendents for meters with breakable frost bottoms, the Buffalo Meter Company is now making the American meter so that it can be supplied in that style of outside case. It is not the intention that this construction shall supersede the older styles of casings in which the meter has been supplied for many years. The frost-proof casing simply provides another type of casing so that that type most suitable for the service conditions may be supplied.

When the meter with a breakable frost bottom casing freezes up and the pressure in the pipe reaches 450 pounds, the bottom casing breaks out at the disc chamber seat. This permits all four parts of the disc chamber to separate and the intermediate gearing to sepa-



WATER METER WITH BREAK-
ABLE FROST BOTTOM

rate at three points, thereby relieving each working part from injurious strain. Protection of the intermediate gearing by freedom of its parts to separate and move with the ice is patented. The disc chamber is supported in a shallow seat, so there is no possibility that it will stick or jam when necessary to remove it for inspection or cleaning. The disc chamber seat is entirely in the breakable bottom, so after each freezing a new and accurately machined seat is provided.

It is claimed that the American meter is the only meter with breakable frost bottom that assembles right side up, that is, the assembly starts by placing the disc chamber in the breakable bottom casing. The flange bolts may be drawn up unevenly or excessively tight and there is no chance of breaking the frost bottom or distorting the measuring chamber, because the pressure comes entirely on the flange gasket. All the features that have added to the accuracy of the Niagara and American meters have been retained in this new frost-proof model. The pivot bearing, intermediate gears, thick reinforced measuring disc, adjustment for high and low pressures, submerged bearings protected against sand and sediment, interchangeable round reading and straight reading registers are all found in the frost-proof model.

CUT STREET CLEANING COSTS SQUARELY IN HALF!



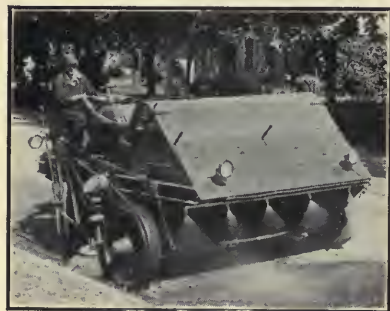
The AUTOSWEEPER

Works at *twice* the speed of horse-drawn sweepers. One AUTOSWEEPER does the work of *two* horse-drawn sweepers.

Sprays the street and sweeps it.

Placed near center of street, it is unequalled as a "feeder" to a pick-up sweeper.

Circular No. A-44 tells all about the AUTO-SWEEPER.



The ELGIN

A sentence from a sample letter:—

"We have made 50% saving in street cleaning since introducing the ELGIN, Aug. 20, 1918." Name on request.

You'll find "*The Eventual Method*" in The ELGIN: the machine that sprays the street, cleans the gutter, sweeps 10 ft. of pavement, collects the refuse and carts it away.

163 owners have 284 Elgin machines.

Circular No. A-48 describes The ELGIN.



The
AUTO-EDUCTOR

During last September, Chicago's 7 AUTO-EDUCTORS cleaned 2,809 catch basins at \$1.90 each.

In the same month, Chicago cleaned 1,165 catch basins by hand. These cost \$4.41 each.

The AUTO-EDUCTOR *saved \$2.51 per catch basin.*

Without alteration, and with little additional equipment, the AUTO-EDUCTOR becomes a flusher, sprinkler, tree-sprayer, snow plow, ordinary truck, etc. Can be used 365 days a year, both day and night.

Circular No. A-50 tells how.

THE ELGIN LINE COMPRISES AMERICA'S LEADERS
ELGIN SALES CORPORATION

501 Fifth Avenue,
NEW YORK

U. S. A.

Old Colony Building,
CHICAGO

Elgin to Sell Otterson Educator

Announcement has been made by George C. Dodge, President, Elgin Sales Corporation, 501 Fifth Avenue, New York City, that the Otterson Auto-Educator for cleaning catch-basins has been taken over by the Elgin organization. It will be manufactured at Elgin, Ill., by the Elgin Street Sweeper Company and will be sold by the Elgin Sales Corporation and its representatives throughout the United States. The right of the Elgin Company in the Auto-Educator cover only the United States and its possessions. Sales will be handled in exactly the same manner as those of the Elgin motor sweeper and other machines of the Elgin organizations.

Norwood Engineering Company Reorganized

On February 15, 1922, the Norwood Engineering Company, of Florence, Mass., underwent a reorganization. The major portion of the capital stock is owned by G. Wilson MacDow, of Boston. The business of the company will be conducted along the same lines and under the same management as at present, with a possible expansion if business warrants. Officers were elected as follows: President and Treasurer, Warren M. King; Vice-President and General Manager, H. W. Hosford; Clerk, H. B. Haven; Assistant Treasurer, G. Wilson MacDow. H. P. Otis of Florence, L. C. Perrin and R. N. Smithers of Boston, with the officers above named, comprise the Board of Directors.

Lang Retires as President of Lakewood

At the annual meeting of the Lakewood Engineering Company, Cleveland, Ohio, Charles F. Lang retired from the presidency. Reports from the field force show every indication of an increase of business in all departments, particularly in the paving and general construction fields. It has already been necessary to increase the factory force to meet the improved demand.

What Antigo Found in its Sewers

Not very long ago the city of Antigo, Wis., was thinking of digging up 450 feet of 24-inch sewer to remove the material that was clogging it. At that time the city got in touch with the Turbine Sewer Machine Company, Milwaukee, Wis., and a demonstration was given in which 2,000 feet of sewer was cleaned the first day. The sewer was found grown full of roots and clogged with sticks and mud, and the only way out of the trouble would have been to dig a new trench along the sewer and lay a new line, all of which would have cost a large sum of money. The purchase of a Turbine machine saved the cost of laying this new sewer. It took three men to hoist chunks of roots and rubbish from the manholes.

In addition to root growths, these machines have removed excess cement at joints and vitreous deposits from sewers in other cities.



A MASS OF LARGE ROOTS TAKEN FROM A 24-INCH SEWER AT ANTIGO, WIS.

General Motors Trucks



Keeping Austin, Minn., Roads In Good Condition

In Austin, Minnesota, as in almost every other hustling community, they appreciate the fact that good roads always lead to better business. And what's more, they have backed up their faith with works as well as words.

So nowadays when one drives into Austin, he is impressed at once by the "spic and span" appearance of the place which is traced immediately to the well-built, clean-kept roads. They leave such a pleasing impression with the visitor that he cannot help but become an enthusiastic booster for the town.

Keeping these good Austin streets clean and dustless has been the task allotted to the GMC truck shown in the photograph above. And it has done this work faithfully and well, providing the same dependable service day after day with uniformly low operating costs.

Many other towns, cities and villages are using GMC trucks with the same satisfying and economical results. For the GMC engine was designed exclusively for motor truck usage with full appreciation of all the essential qualities necessary for the success of such an engine under all conditions—economy of operation—surplus power—and quick accessibility for readjustment and replacement, with the consequential lowered costs for this work.

Removable Cylinder Sleeves

As an example of the practical accessibility of GMC construction it is possible to remove a cylinder sleeve from the GMC engine and

replace it in a few hours. This eliminates the heavy repair expenses that follows when the entire cylinder block must be taken from the truck and remachined, as in the case of the common type of engine.

Each cylinder in a GMC engine is a separate sleeve which is pressed into place in the cylinder block. The sleeves are machined on both sides to accurate thickness and the expansion and construction of the walls under temperature changes, is consequently spread evenly, preventing the cylinder from becoming out of round and causing excessive wear.

No Lost Compression

Moreover this type of cylinder construction insures an absolute and continuous fit of piston rings and pistons, preventing any loss of compression as is the case of the common type of engine when cylinders become out of round.

This is only one of the many improved features of GMC construction that truck buyers everywhere appreciate because they insure more and better motor truck service at a lower cost for maintenance and operation.

Furthermore, with all these improvements, substantial reductions have also been made on the complete line of GMC trucks from one to five tons capacity which increase still further their practical economy for all hauling requirements. Write for a copy of our special truck book, it will be sent to you promptly without obligation.

GENERAL MOTORS TRUCK COMPANY

Division of General Motors Corporation

Pontiac, Michigan

DEALERS AND SERVICE IN MOST COMMUNITIES

When writing to Advertisers please mention THE AMERICAN CITY.

Volume

XXVI

Number 4

The American City Magazine

New York

April

1922

What Are Your Municipal Problems?

A Series of Questions Relating to Activities Now Receiving the Attention of American Cities

FOR the purpose of assisting mayors and other city officials, especially those newly elected, in preparing their municipal programs, THE AMERICAN CITY presents a list of important activities and problems that concern progressive cities. In view of varying conditions and circumstances in different cities, the adoption of all these suggestions by any one city is not urged, but municipal officials may gain valuable ideas from a study of these questions.

Administration

Does your charter need revising in whole or in part? Many cities have been able to more economically administer their corporate business by judicious changes in their charters, enabling them to adopt commission government or the city manager plan.

Are your local ordinances in need of revision and codification? Several cities have revised and codified their ordinances in the last year or two for the clarification of municipal business and administration.

Is the election machinery in your city effective and operated at a minimum cost? This problem is receiving special study, and where election machinery is controlled by the state, action is being taken to reduce the cost of elections within cities without impairing the efficiency of the election machinery. The adoption of voting machines in many places has been one great step in this direction.

Is the organization of your city departments effective, and are the blank forms used by them satisfactory? Many cities are still using obsolete and unnecessarily intricate forms in their health, fire, police, building, inspection, tax, purchasing, street cleaning and other departments and bureaus. The use of carefully designed forms and of machine addressing frequently makes big savings in departmental budgets.

Taxes and Assessments

Does your board, bureau or department of assessment and taxation need to be reorganized? In some states a city is permitted by ordinance to abolish its elective assessors and to establish a department of assessment and taxation with a single head appointed by the mayor and a board of review.

Does your method of assessing real and personal property need to be revised? A large number of cities within the last two years have reorganized their methods of assessment and are now operating on a much more efficient basis. A number of large cities have also increased their assessed valuation, so that real property is now assessed at or near 100 per cent of its true value.

Does your method of levying special assessments for local improvements need to be changed? This is a matter which has been brought up for serious consideration in nearly 200 American cities within the last few years.

Do you need to improve your method of collecting delinquent taxes? Tax collection is usually a knotty problem with city officials, and a careful study of it may mean immediate and larger returns to the city and a lessening of tax sales.

Finance

Has your city adopted a uniform accounting and budget system? Many cities have made notable progress in this work within the last two years, reducing the labor of accounting systems through loose-leaf ledgers and other devices and effecting greater economies through proper budgeting.

Has your city adopted central purchasing for the various department bureaus and officials? A large number of Mid-Western and Western cities have adopted central purchasing and effected great economies in the buying of office supplies, machinery, etc., for municipal work.

Is your city receiving a fair rate of interest on its daily bank balances and time deposits? This is a great source of trouble in some municipalities and results in the loss of hundreds of thousands of dollars each year if daily bank balances and the interest thereon are not checked up.

Is your city adequately regulating and licensing businesses and private activities? Several cities within the last year have revised their license ordinances so to provide more effective regulation and more adequately reimburse the city for the cost of the licensing. This is one satisfactory and proper method for increasing municipal revenue.

Salaries and Pensions

Are you paying your city officials and employees too little, or too much? THE AMERICAN CITY has given much time and space to the investigation of this subject and has published extensive tables giving the salaries paid to municipal officials in various offices throughout the country.

Are your municipal pension systems and funds for policemen, firemen and other employees effective and in satisfactory condition? In many states the employers' liability laws apply to cities as well as to private employers. Proper care should be taken to finance pensions and compensation funds either through a reliable company or through municipal insurance.

Has your city adopted the most economical methods of insuring municipal employees? There are several methods in use to-day which can be studied to advantage by municipal officials.

School Finance

Are your relations with the school authorities as to management and financial control satisfactory? Inasmuch as education is usually the leading item in a municipal budget, great care must be exercised in the expenditure and the methods of control and management of school funds, and systems should be studied with a view to making more effective use of the money and to increasing the value of the educational system of the community.

Health

Does your city health work need to be re-organized? In some states, laws have been passed permitting the abolition of the bureau or board of health and the creating and maintaining of a department of health with a single head appointed by the mayor. Inasmuch as the health department is one of the most important to the welfare of the city, a full-time health officer with adequate appropriations should be maintained.

Is it the practice in your city to destroy school books and supplies furnished at public expense and used by pupils with contagious disease? If after investigation, it is found that your city is doing so, the matter should be taken up at once with your board of health to determine whether it is possible to eliminate this item of expense through disinfection.

Is your city effectively regulating soft-drink places? Model ordinances on this subject have been prepared and careful studies of the subject made by cities, with regard both to health and to finance.

Street Paving, Lighting and Cleaning

Are your streets properly paved to handle the type and volume of traffic they are called upon to carry? A careful study must be made of the volume of traffic in each part of the community, to decide whether dirt roads, water-bound macadam, bituminous types, Portland cement concrete, brick or other type block roads are necessary to carry local or through traffic as the case may be.

Are your business streets and residential

districts adequately lighted? In order to protect your city from crime and accident, ample street lighting is necessary. The higher-value business districts are made even more valuable through ornamental lighting, which lengthens the business day and brings added prosperity to the community.

Is your method of street cleaning effective and economical? Many cities in the United States are revising the organization of their street cleaning departments and methods of street cleaning through the adoption of more modern apparatus.

Fire Department

Is your fire department efficient and operating at a minimum cost? One of the problems now receiving the consideration of officials interested in fire fighting is the motorization of fire apparatus, the establishing of the two-platoon system and the extension of fire prevention work.

Is your city effectively regulating the installation of gasoline curb pumps and gasoline tanks? As installations of this type in automobile service stations may be a great source of danger to life and property, adequate attention and proper regulation are vital.

Police

Is your police department efficient and operating at a minimum cost? Crime prevention is an important problem now being studied by many American cities. The use of motor vehicles by criminals is forcing many cities to revolutionize their methods of patrolling streets and highways. Traffic regulation and parking of vehicles are also problems that have increased in importance in the last year or two.

Is your city effectively regulating pool and billiard rooms? A careful regulation is necessary in places of this type to prevent their becoming gambling establishments or gathering-places for criminals.

Traffic Control and Accidents

Do you have any difficulty in handling traffic at congested points? From the smallest village to the largest city, the problem of traffic regulation is assuming added importance. Suitable silent policemen or different types of traffic signals should be studied carefully, as they do much to pre-

vent accident and expedite the movement of traffic.

Are there any grade crossings in your city where accidents may occur? The elimination of grade crossings is one of the vital problems in many American cities to-day. With the increasing number of motor cars carrying more people out on the highways, grade crossings are a constant source of danger and should be eliminated by judicious handling of the question of ways and means with the railroad.

Water

Have you taken cognizance of the fact that adequate filtration and sterilization of your water-supply is necessary to protect public health? A study of municipal water-supplies shows that there are practically none which can do without either filtration or sterilization as a protection against water-borne disease.

Is your municipal watershed completely reforested? The reforestation of municipal watersheds is not expensive, and with proper care the revenue which can be derived therefrom increases as time goes on.

Zoning and Building

Is your city zoned? Proper and judicious restrictions placed on various districts as to the types of structure and business which may be conducted in those zones go far to stabilize real estate value.

Are the plumbing, building and sanitary codes of your city effective and up-to-date? A study of the codes of other cities may be of great assistance in producing a more effective code for your city. It may mean more economical construction, which will have a direct bearing on the solution of the housing problem.

Parks and Playgrounds

Is your park area sufficient to provide a breathing space for all living in the congested portions of your city? Adequate breathing spaces in the form of parks, both large and small, need to be provided in every city for the well-to-do as well as the poor. Such spaces increase the healthfulness of the community and add to its material happiness.

Have you well-equipped playgrounds for children? One of the best ways to control

the old "gang spirit" and to build up the moral and physical health of children living in the congested districts is through well-equipped playgrounds judiciously distributed throughout the town or city.

Waste Disposal

Is your method of collection and disposal of municipal garbage satisfactory and economical? One of the liveliest questions in municipalities to-day is the proper method of collecting and disposing of garbage. There are a number of systems of collection and methods of disposal to choose from, which each city must study from the standpoint of local conditions.

Is your method of sewage disposal effective, or do you need to adopt some new system? Sewage disposal has undergone almost revolutionary changes within the last ten years, so that now the sewage of a large city may be disposed of in a much smaller area than heretofore and with less nuisance,

and the sewage of a small city can be treated properly in an exceedingly small area or within one inconspicuous building.

Municipal Markets

Have you municipal markets, and, if so, are they satisfactory? An increasingly large number of American cities have instituted markets under the direct control and supervision of the city. These have greatly reduced prices and have gone a long way towards helping the taxpayer of moderate means during the period of high prices.

City Automobiles

Does your city effectively and economically care for and regulate the use of automobiles owned by it and used by officials and employees? This is an important matter, and the adoption of a municipal taxi service has proved of great economy in a large number of cities.

Cooperation and Planning Bring Many Improvements

New Water Pipe, Street Lighting and Gas-Mains for Prescott, Arizona

By M. R. Hirshfeld

THE business streets of the city of Prescott, Ariz., for a number of months resembled nothing else so much as a shell-torn village in Belgium during the late World War, with this exception—the tearing up and the work done were constructive rather than destructive.

Preparatory to paving fourteen blocks of the business district, the city installed new water-mains, \$22,000 worth of 10-inch cast iron pipe being put in at a cost of \$10,000 for labor. Despite about two weeks of very wet weather, when the trenches had to be drained numerous times and much trouble with caving trenches was encountered, the work was completed well within the specified time limit. With the filling in of the trenches, Prescott streets began to resume a normal appearance.

While the city was installing these new water-mains to replace the steel pipe that had been laid nearly 40 years ago, the Pres-

cott Gas and Electric Company installed in the business district gas-mains large enough to serve the city of Prescott until it has increased in size three times. The gas company also made repairs and replacements where necessary in the residence districts. The result is that now that the street paving has finally been done, it is down for good, and little tearing will have to be done later to permit laying or repairing gas- or water-mains.

Better-Lighted Streets

Next on the program of civic improvements was the street lighting. Prescott's streets were illuminated with the old-fashioned high swinging lights placed at the intersections of the streets, save in a part of the residence district, where modern ornamental iron standards had already been installed. The City Council let a contract calling for ornamental standards for the



A TYPICAL SCENE IN PRESCOTT WHEN GAS AND WATER MAINS WERE BEING LAID OR RENEWED PRIOR TO PAVING BUSINESS STREETS

business district and for a few additional blocks in the residence district. Novalux globes were specified for use in the downtown district. A local electrical company was given the contract for the lighting, at a price of approximately \$12,000.

Following the installation of the lights will come the paving of all the downtown streets. It had been hoped to have that work completed by January, 1922, but the City Council found the bids of local and foreign contractors were too high. The lowest bid, of \$3.68 a square foot, was refused, and the Council decided it was too late in the fall to ask for new bids. Now the work must necessarily be delayed until the early spring, at which time it is the plan of the city to rush it to completion. In the meantime, Arthur J. Kline, the City Engineer, has been instructed to obtain figures on all-concrete, concrete with bitulithic base, and black base paving. The sum of \$200,000 has been set aside by the city to be expended on the paving. Some paving work has already been done this year on one of the residence streets, Warrenite-Bitulithic surfacing having been used. The cost was \$85,000, and ornamental lights on the same street were installed at a cost of \$7,260.

In the early spring one new bridge is to be constructed, a reinforced concrete structure, for which a sum of \$20,000 has been appropriated. A group of local construction engineers have entered bids for its construction.

On the city budget for the current year, provision was made for a children's playground, sufficient funds having been appropriated to make the first purchase of playground equipment. This is to be supplemented by popular subscription during the winter, and early spring should see the city ready to install such equipment.

Heretofore, the supply of water in the city of Prescott during the dry summer months has been something of a problem. Following the planning of the other civic improvements, the city last year voted \$350,000 water bonds. This sum is to be expended in the construction of three additional reservoir dams and pumping plants. About \$50,000 is to be used on a reservoir dam at Banning Creek, three miles from Prescott, an additional \$16,000 has been set aside for replacing old pipe and laying new, and the remaining \$275,000 will be used to dam Granite Creek and the Hassayampa River.

That the United States Government intends to cooperate with the city of Prescott in this elaborate program of municipal improvement can be seen in the tentative plans being prepared for the erection of a new post office, one that will be in keeping with the state and county buildings in the city. The Government already has purchased a site for the new post office directly opposite the county court house, which is situated in the center of a parked block in the heart of the city.

New Swimming Pools in Birmingham, Alabama

City and Local Manufacturer Jointly Finance Two Large Concrete Swimming Pools Near Industrial Section

By Helen Bethea

IN the summer of 1921 the city of Birmingham, Ala., and the Tennessee Iron and Coal Company completed two swimming pools at Ensley, within the limits of the city and at a convenient walking distance from the industrial section, supported by the plants and the mining interests of the company. The completed pools cost \$45,000, the company furnishing \$25,000 and the city paying the remainder of the expense. The pools measure 50 x 100 feet each and are 3½ feet deep at the shallow end and 9 feet deep at the other. They are separated by a 12-foot concrete walk.

The pools are not covered, but buildings practically surround them. At one end is the filtration plant and at the other the gal-

ping is so arranged that the water is returned to the pool through four orifices located at the shallow end of each pool near the floor. By this means almost perfect circulation is maintained, as is demonstrated by the fact that bathing caps, belts and other articles lost in any part of the pools always drift rapidly to the grating over the suction pipe to the pump.

The water in both pools is turned over every 24 hours, and although the attendance is from 300 to 2,000 per day, bacteriological tests have shown the water to be satisfactory at all times. Since the pools have been in use, they have been emptied and scrubbed every two weeks. This is not necessary from a sanitary point of view, but is highly



THESE TWO POOLS FURNISH SAFE RECREATION TO THE PEOPLE OF BIRMINGHAM, ALA.

lery for spectators. On both sides are the bath-houses, administration building, and lockers, so that the pools are entirely surrounded and are accessible only through doors and passages.

The capacity of each pool is approximately 250,000 gallons of water. They are filled with filtered water from the city supply. The water is then pumped from the lowest point in each pool by a centrifugal pump and forced through pressure filters and thence to the ultra violet ray sterilizers, from which it is returned to the pool. The

desirable because, since the pool is not covered, moss or algae grow along the sides, making the water appear very dark in color even though samples taken from the pool are perfectly clear when examined in a glass cylinder.

When the pools are emptied, the sides and bottom are washed and scrubbed with brooms and scoured with a hose. Chloride of lime is sprinkled over the exposed surfaces. The addition of a small amount of bluestone to the water has been found to materially retard the growth of the moss.

Interest in Annual Reports

A City Manager and a Water-Works Superintendent Strive for Reader Interest

THE first semi-annual report of Harrison G. Otis, City Manager, Clarksburg, W. Va., to the City Council has recently appeared in pamphlet form and contains features that are somewhat out of the ordinary. This report was ordered published by the City Council, and 5,000 copies were distributed from house to house by the Boy Scouts without charge. Each copy contained a reply card addressed to the City Manager and provided with space for the filing of suggestions and complaints.

The report is only 24 pages in length and is written in simple language, with short paragraphs and frequent headlines, and with only the small amount of figures necessary to bring out the desired comparisons. At the beginning is a full list of the personnel of the city government, followed by an alphabetical schedule of all the items connected with the operation of the municipal government concerning which the public most often seek information. With this schedule the telephone number and the official to be called in each case are given.

Following the list of city officials comes a "Foreword and Summary," epitomizing in single sentences the chief points of interest in the report proper. The report itself sets forth the progress which has been

made under the new form of government. Frequent bold-faced subheads separate the stories into easily digestible portions.

A tentative program for street improvement lists about eighty streets which it is hoped the city will be able to pave during the next two years. This is followed by a detailed outline of the proposed bond issue and a schedule of improvement procedure which boils down several pages of legal red tape into fifteen short sentences. The back page of the report is devoted to "Do Drops" as presented herewith.

The reaction of the taxpayer to this informal plea for cooperation is exceedingly interesting. The City Manager has received scores of reply cards which have been mailed by citizens after reading the report. The suggestions deal

with almost all the stages of municipal construction and administration. Requests for street lights, street and sewer repair and improvements of various sorts are common. One lady suggests "Fifty dogs less in Goff Plaza" as a desirable city improvement. Several new customers for the city's waste collection system have resulted from the "Do Drops." The proposed bond issue is the basis of many of the replies received.

In addition to the written complaints and suggestions received, a large number of

"DO DROPS"

To Refresh the Memory and to Revive the Spirit of Co-operation

Do drop the habit of making messenger boys of your Councilman; Phone "92" instead.

Do drop around to the Colonial Building and get acquainted with your city employees.

Do drop a line to the City Manager, making suggestions and complaints, but do not forget to sign your name.

Do drop the custom of calling up city officials at their homes, outside of office hours, except in emergency cases.

Do drop in and make the City Treasurer glad by squaring up old accounts, if you owe the City money.

Do drop the idea that the police can make and keep the town clean morally, without your help.

Do drop a hint to the police judge when you suspect law violation; your confidence will be respected if requested.

Do drop a card to the City Physician, or call "331," whenever you learn of any reportable disease, even a very mild case.

Do drop the notion that the Health Department is designed as a spite bureau, for use in "neighborly" altercations.

Do drop your garbage and other trash in proper cans for city collection, and not in the alley or over the river bank.

Do drop the hope that all street and sewer complaints can be given immediate attention; there are 28,000 other folks in town.

Do drop the theory that a few soft coal cinders on a soft mud road will make a good pavement.

Do drop over on Hewes Street and see our "central fire station." Then work for one we need not be ashamed of.

Do drop in at the Public Library some afternoon or evening and see what we have and what we need.

Do drop your work for two minutes more and lend a constructive thought to your city government.

Do drop the attached coupon into the mail box or bring it with you when you call at the Colonial Building

Do drop your "hammer" and pick up your "saw" and "Let's go."

citizens, who very likely have learned through the report who are the proper officials to deal with various matters, have visited the city offices for personal interviews. The experiment of printing and distributing a reasonably interesting and easily read city report has resulted in increasing the number of contacts between the city government and the citizens and has been found quite worth while. City officials interested in securing copies of this report as a sample for consideration and study, may write to Harrison G. Otis, City Manager, Clarksburg, W. Va., for a copy.

Finding Out Who Read the Report

The extent to which citizens usually read municipal reports is well illustrated in a recent example cited by Beekman C. Little, Superintendent of Water-Works, Rochester, N. Y. Year after year he had been writing what is called an "Annual Report of the Water Bureau" for the Mayor's annual message. He had the idea that nobody ever read the report, and wanted to test that statement, so, hunting through the dic-

tionary for some outlandish word which might attract attention, he found the word "gallimaufry" [a hash or hodge-podge, Ed.] and used it in describing an old small water-works plant which the city had absorbed in extending its territory. He found out very quickly that the reporters at least read the message, for they jumped at that word like a trout at a fly and, through the locals columns and the editorials of the Rochester papers, a great deal of publicity was given to "gallimaufry" and the Water-Works Superintendent. Mr. Little states, however, that in spite of this, not many people read the report.

City departmental reports are frequently garbled in the newspapers, and therefore the preparation of a short, interesting report which can be distributed at little or no expense through the cooperation of that admirable organization, the Boy Scouts, opens a field for the serious consideration of municipal officials. By distributing the report direct to the homes, the city official is sure that his message has reached the citizen and the taxpayer in exactly the form in which it was prepared.

School Buildings Make Costly Bonfires

A Warning—Most of These Fires Occurred in Small Towns and Cities

By Norman M. Stineman

A FAIRLY close watch on newspapers during December and parts of November and January, when the cold weather season was upon us, revealed the complete destruction by fire of thirty-one school buildings in various parts of the United States, with a total reported loss of \$2,600,000. A number of other school fires which caused damage of varying degrees without causing complete destruction are not included in the foregoing figures. While these reports are unofficial, it is altogether likely that the cost of replacing the destroyed buildings will be far greater than the value of the old structures. For instance, the loss reported on the high school at Millinocket, Me., was \$60,000, while the school board is now having plans prepared for a fire-proof building of much larger

dimensions and greatly improved facilities, which will cost several times that amount.

The schools reported as completely destroyed by fire are the following:

High school at England, Ark., destroyed November 10, 1921. Loss \$50,000.

High school at Millinocket, Me., destroyed November 13. Loss \$60,000. Fire started in furnace room. Plans under preparation for much larger fire-proof building.

High school at Venus, Tex., destroyed November 19. Loss \$45,000.

High school at Lake Odessa, Mich., destroyed December 4. Loss \$60,000; insurance \$42,000. School officials having plans prepared for a fire-proof building.

High school at Cold Spring, Ky., destroyed December 6. Loss \$30,000; insurance only \$3,000. This was a two-story brick building built in 1850.

Village public school at Aberdeen, Tex., destroyed December 6. Loss \$3,000. Cause of fire unknown.

High school at Marshall, Mo., destroyed December 7. Loss \$70,000; insurance \$36,000. Cause of fire unknown.

College building at Wilberforce University, Wilberforce, Ohio, destroyed December 7. Loss \$300,000. Cause unknown.

High school at Scotts, N. C., destroyed December 8. Loss \$20,000; insurance \$12,500. Fire started in fur-

nance room. The building had just been completed in time for the opening of school last fall and was one of the best-equipped high schools in that section of the state.

High school at Roy, N. Mex., destroyed December 9. Loss \$45,000; insurance carried by the contractor. The building was under construction and nearly completed, and was to be occupied January 2, 1922.

High school at Santa Rosa, Calif., destroyed December 17. Loss \$75,000.

High school at Houghton, Mich., destroyed December 18. Loss \$150,000; insurance \$115,000. Fire started in basement. Built in 1899.

High school at Presque Isle, Me., destroyed December 23. Loss \$60,000.

Kentucky Military Institute at Lyndon, Ky., destroyed in December. Loss \$100,000.

Henry Lord Grammar School at Fall River, Mass., destroyed December 26. Loss \$300,000. The building was under construction and nearly completed. Fire probably due to defective wiring.

Nine-room high school at Sinking Springs, Pa., destroyed December 26. Loss \$60,000.

Lewis and Clark Grade School at Wenatchee, Wash., destroyed December 27. Loss \$30,000; fully insured. Fire started in upper part of building, probably from defective wiring.

High school at Maquoketa, Iowa, destroyed December 29. Loss \$80,000. Fire started in fuel room.

Administration building of Lyndon Institute, Lyndonville, Vt., destroyed January 3. Loss \$70,000; insurance \$42,000. Cause unknown.

High school at Troy, Pa., destroyed January 6. Loss \$100,000; insurance \$65,000. Caused by defective chimney.

Independent school at Itasca, Tex., destroyed January 6. Loss \$10,000; insurance carried.

Blackstone College for Girls at Blackstone, Va., destroyed January 9. Loss \$175,000; insured. Building destroyed was only one remaining, a companion structure having been destroyed by fire in May, 1920. Will rebuild fire-proof.

Building of Morristown Normal and Industrial College, Morristown, Tenn., destroyed January 10. Loss \$100,000.

High and grade school at Barnum, Minn., destroyed early in January. Loss \$75,000.

High and grade school at Clarksburg, Tenn., destroyed January 12. Loss \$10,000; insurance \$5,000. School was built only five years ago.

High and grade school at Otter Lake, Mich., destroyed January 13. Loss \$40,000. Building was completed only two years ago. Cause of fire undetermined.

Administration building of Blackstone Military Institute, Blackstone, Va., destroyed January 14. Loss \$150,000. Probably due to defective wiring. Fire occurred only five days after burning of a girls' school in the same city.

St. Bartholomew's school at Columbus, Ind., destroyed January 17. Amount of loss not reported. Fire started in basement. First intimation of fire came when flames and smoke burst through classroom floors occupied by the children.

High school at Wallowa, Ore., destroyed January 19. Loss \$50,000; insurance \$34,000. Built in 1910, and one of the best-equipped high schools in eastern Oregon.

High school at Niagara Falls, N. Y., destroyed January 24. Loss \$200,000; insured. Fire started in chemistry laboratory.

Eight-room public school at Port Morris, N. J., destroyed January 25. Loss \$60,000; insurance \$28,000. Caused by defective chimney.

Perhaps the most noticeable fact regarding these fires is that, with two exceptions, all of them occurred in comparatively small cities and towns. This bears out the statement made in an article on page 469 of the November, 1920, issue of THE AMERICAN CITY to the effect that fire-proof construction for school buildings is even more neces-

sary in smaller towns and cities and in the open country than in larger cities. In the smaller communities fire protection is either entirely absent or, at the most, is not as prompt or effective as in large cities having well-organized fire departments. This is not an argument for non-fire-proof construction of schools in large cities, for even in those communities an occasional disastrous fire proves the need of fire-safe schools. Then, too, reports are not lacking of instances where fire-proof construction prevented the spread of school fires that might otherwise have resulted in costly damage or complete destruction, thereby proving that fire-proof construction is a good investment.

It is extremely unfortunate that we continue to burn up our schools while many cities are putting forth every effort toward the raising of funds for new schools, in the attempt to catch up with the increased school population. It is still more unfortunate that many school boards continue the penny-wise and pound-foolish policy of building new schools of combustible construction, on the theory that they can be built for less money. Perhaps they can be; but the slight saving in first cost is out of all proportion to the advantages that might be gained by spending a little more money on first cost, thereby giving the community a school that will not burn, that will be a permanent investment, will command low insurance rates and require but small maintenance expenditures.

Other school boards are awake to the lessons taught by the fires, for news comes from Millinocket, Me., and Lake Odessa, Mich., to the effect that the new schools planned to replace the destroyed buildings will be as fire-proof as modern design and construction methods can make them. At Champaign, Ill., the Chamber of Commerce has decided not to wait for a disastrous fire, for a committee of the Chamber is investigating existing schools with the idea of making them more fire-resistive. In view of the conditions so forcibly demonstrated by the long casualty list of destroyed buildings, school boards that continue to build combustible structures are failing utterly in their duty to the community.

The Municipal Forest of Malone, N. Y.

By J. H. King

Chairman Forestry Commission, Malone, N. Y.

UNDER a New York State law of 1914, the village of Malone took up the reforestation of 35 acres of denuded pine land, given to the village by the Malone Light and Power Company. The state furnished free of charge, with the exception of transportation, 300,000 four-year-old transplants, made up of white and Scotch pine and some 500 North Carolina poplar cuttings. The young trees were set out in seven hours by some fifty high school boys working under the supervision of a representative of the State College of Forestry at Syracuse. This was in April, 1920. The

tended to reforest, so that in the end there will be a forest of not less than 100,000 trees, and in time the village will have a source of revenue in the reforested area if it is handled properly.

The high hill on which the village reservoir is located, known as the Pinnacle, is to be covered with trees. When this is completed, it will be one of the beauty spots of the town.

The municipal or town forest idea is a rather new thing in the United States, but it has been tried and found profitable in Europe, where many towns derive sufficient



PLANTING TREES IN A DISTRICT NEAR LACONIA, N. Y., ON LAND SIMILAR TO THE MALONE PLANTATION

spring of 1921 found the poplars all dead, and all but about 3 per cent of the pines living. The result was so encouraging that the Chamber of Commerce planned to continue the reforestation last spring. It was, however, impossible to secure suitable planting stock. On account of the dry season it was not deemed advisable to plant in the fall, so the Chamber planned to go on with the work this spring.

There are probably 35 acres more of the same type of barren land in the gift of the Light and Power Company, which it is in-

revenue from their public forests to largely offset the taxes. Many small towns in the Black Forest of Germany have no taxes to pay, because of their public forests, and in some instances the citizens even receive a dividend instead of a tax bill.

On account of the large amount of idle land suitable only for forest growth in many sections of New York, and also because of the scarcity of our timber supply, it is believed that other towns could well follow the example of Malone in establishing a municipal forest.

PLANT MUNICIPAL FORESTS AND PROTECT THEM

One tree will make a million matches; one match may destroy a million trees.

Covering a Concrete Reservoir Saves Money



New Reservoir Reduces Fire Hazard—Covering Protects Health

By L. J. Jellison

THE city of Dubuque, Iowa, has adequately protected its main business district from the scourge of fire and provided for the health of citizens through the completion of a 7,500,000-gallon covered reservoir located on an eminence 250 feet above the valley business center and a few blocks away from main factories and business places. This concrete reservoir with its slightly arched cover is 180 feet in diameter and 41 feet in depth. The cost for the reservoir proper was \$82,000, and the concrete cover was \$32,000, a total of \$114,000.

The reservoir tank was completed several years ago, but because of its open top it was impossible to keep the water clean. In summer it was necessary to clean the tank every ten days. The fire hazard, due to putting the tank out of commission, was increased. Thus the reservoir was an expensive proposition, through labor and loss of water incident to the cleaning process. The full 7,500,000-gallon storage capacity now insures a main pressure of from 85 to 95 pounds, whereas under old conditions 65 to 75 pounds pressure was all that could be maintained with safety.

Benefits to the city from the improvement have been four-fold. The town has been given a clean bill of health. Future expense of cleaning the reservoir during the summer months has been done away with, through elimination of algae growth and possible contamination. Fire underwriters have given the city a number of credit points that will in time reduce insurance rates. The construction of the arched top is such that at some future date it can be utilized as the

foundation of a community building, or as a skating rink.

Construction of the Reservoir

The reservoir was hewn from practically solid rock, and thus a saving of \$80,000 was effected through its location at the present site. Proposals made at the time it was contemplated favored a high bluff, adjacent to the water-works plant near Eagle Point, and removed from the territory to be served by more than two miles. With friction losses so high in pumping such a distance, engineers determined the greater value of the present site overlooking the business artery of the city, obviating the necessity of pumping the water a second time, and allowing transference of many patrons from high to low service.

The main pumping station of the city is located at Eagle Point, where sheer bluffs rise along the shores of the Mississippi River. The water-supply is obtained from sand and gravel wells ranging in depth from 100 feet downward. A surface storage reservoir of 650,000-gallon capacity acts as a mediary to the distribution system. There are two services, high and low. Formerly the low service was limited by the level of water in a reservoir of 1,000,000-gallon capacity built to impound water from mine workings. High-service pumps, electrically driven, took the water from the level reservoir.

With the reservoir completed and in its present location, the high friction loss as a result of the long-distance flow has been eliminated. An almost perfect balance is

maintained in all parts of the city, according to needs, and with only a 3-pound pressure loss as against a 41-pound pressure loss had the reservoir been erected on the site first chosen.

In constructing the reservoir, contractors were confronted with a limestone rock and homogeneous clay formation. A circular reservoir was decided upon because of excellent approach to property, plat and allowance for a new high-service pumping station to be built in the future.

The reservoir bottom was made level with rock strata and with only enough pitch to drain. The lower wall was built solidly against rock. Despite the fact that the upper portions of the wall were to be surrounded with clay and rock to its top, the wall was made just as strong as though no

earth were to be against it. A thin wall, practically without horizontal reinforcement wherever it was against solid rock, was erected. Stresses in the wall above the rock were transmitted to solid rock by means of buttresses. Steel dams $\frac{1}{8} \times 8$ inches, to prevent seepage, were provided for 4-foot concrete wall sections extending without break around the reservoir.

A 24-inch cast iron pipe acts as inlet and outlet for the reservoir. A check valve opens in and out of the reservoir. Incoming water is circulated around the reservoir, and produces as much stirring as possible without artificial means. The flow out of the reservoir is from all directions. The valve arrangement is such as to give adequate circulation within the reservoir at minimum cost.

Enforcing the Standard Weight Bread Law in Los Angeles County

AT the Fourteenth Annual Conference on Weights and Measures, the substance of which has just been made public by the Bureau of Standards of the Department of Commerce, in Miscellaneous Publication No. 48, Weights and Measures, Charles M. Fuller, Sealer of Weights and Measures of Los Angeles County, Calif., gave some interesting data in regard to the enforcement of bread legislation, including tolerances, the result of five years' successful enforcement of a standard weight bread law.

The law provides that the standard weight of all loaves of bread within 12 hours after baking shall be 16 ounces, 24 ounces, or multiples of the 16-ounce size. A tolerance of one ounce above the standard weight is allowed for each 16-ounce unit, but no stated tolerance below the standard weight is allowed, because, were there such a tolerance, certain unscrupulous bakers would not hesitate to scale their bread that amount short. At least 25 loaves are weighed, and the average taken is established as the standard weight. If there is any doubt about the

average weight, several hundred loaves are often scaled.

When the bread is found short and the baker has had a previous good record, all bread as much as an ounce under weight is seized for distribution to charitable institutions, and the baker is given a warning. If the offense is repeated, the bread is confiscated and the baker is prosecuted as well. All weighings are entered on cards printed for that purpose, and these are filed under the name of the bakery so that a record of every place of business is readily available.

In the enforcement of this act, 25 bakers have been convicted, \$535 in fines has been collected, and several thousand loaves of bread have been confiscated and turned over to charity. The act has worked out so successfully in eliminating the unfair competition of bakers who would cut the price by selling an underweight loaf, that even those firms that were first opposed to the standard weight bread law are now in favor of it. At a meeting of the Wholesale Retail Bakers Association of California, a unanimous resolution was passed endorsing this law.

Municipal Tennis Courts in London

An example of the interest shown in tennis in England is gleaned from the fact that London has 589 tennis courts under municipal control, and although the fee for playing is quite small, the receipts from these courts last year totaled \$40,000.

The Use of Local Mineral Aggregate in Bituminous Macadam Roads

By Major W. A. Welch

Chief Engineer and General Manager of the Palisades Interstate Park Commission of New York and New Jersey

THE proper use of local mineral aggregate in bituminous road construction means great economy in these days of high transportation and labor costs. It is possible to build good bituminous macadam road surfaces with practically any stone or coarse gravel found in the United States, provided this aggregate is free from loam, dust and silt when used.

The Subgrade Is the Real Road

The bituminous mixture is, at best, a wearing surface, like the rails of a railroad, and it must be thoroughly and properly supported by the subgrade or it will fail. The subgrade is the real road. It must be properly placed, thoroughly drained, well settled and compacted, and on such a subgrade, except on main trunk roads, a bituminous surface can be laid successfully with a mineral aggregate of comparatively low crushing strength. It is, of course, very necessary to thoroughly bond this aggregate and keep it free from moisture, dirt and dust, for these are the greatest enemies of proper bonding.

A railway engineer establishes the size and weight of his rails in accordance with the weight and speed of his traffic. On main trunk lines these rails are made heavy enough to carry the heavy, fast traffic, in spite of minor defects in the subgrade, but on the branch lines and feeders the rails are lighter for economy's sake. Experience has taught these things and many others

to the railway builders, and the highway engineer should profit by these years of experience and experiment, for our highways have become very like our railways. Main trunk lines should have wearing surfaces which will carry any traffic and any speed, without failure, in spite of minor defects in the subgrade, but such surfaces are not necessary on minor roads, and it is not economy to build them.

The safe crushing strength of trap rock or basalt averages approximately 350 tons per square foot; granites, 350 tons per square foot; limestones and marbles, 300 tons per square foot; sandstones, 215 tons per square foot; good air-cooled slag, 300 tons per square foot; and ordinary chalk, 15 tons per square foot.

It would seem much wiser for the engineer to carefully study all available local mineral aggregates and prepare his specifications to permit the greatest possible use of them in his surfaces than to fall into the easier method of copying standard specifications, thus compelling contractors to import these aggregates and so greatly increase costs. Better put this extra money in your subgrade work, as that is really your road.

It is possible to build good bituminous macadam road surfaces with practically any stone or coarse gravel found in the United States, provided this aggregate is free from loam, dust and silt when used.

Practically all the stone in this country comes within these limits, and all of it, save the chalk and very soft sandstones, will make good bituminous macadam road surfaces. Specifications must vary with the types; the softer aggregates must be used in larger sizes, greater care must be exercised with them to keep out the dust, and the rolling must be governed by the type of aggregate. The harder stone can be thoroughly compacted by heavy rollers and still be penetrated and thoroughly bonded by the asphalt or tar, but the softer stones, when used in penetration work, must not be rolled as hard, or they will not allow the binder to properly fill the voids. Care must be taken to keep the aggregate even, as many

quarries have seams or strata of soft shaley stone, which, if put in with the better material, will cause trouble. More care must be taken with the top course or seal coat when the softer aggregates are used, to insure a thorough coating on the actual wearing surface.

The Cause of Failures

There is little accurate information ob-

Other failures were plainly due to improper mixing or penetration, from careless workmanship; others to the careless use of dirty aggregate, so full of loam, silt or dust that the binder was not able to reach the stone; or the aggregate was badly graded; or the binder was bad or improperly heated. One sheet asphalt failure was due to the use of glacial silt as the only aggregate, ground as fine as cement.



LAYING THE TELFERD BASE OF A BITUMINOUS MACADAM PAVEMENT IN A HEAVILY TRAVELED SECTION OF THE INTERSTATE PALISADES PARK RESERVATION, NEW JERSEY

tainable on this subject. Few experimental sections of such surfaces have been laid and watched. Of all the failures of bituminous macadam surfaces which have come to the writer's notice, none have been due in any way to the character of the mineral aggregate. By far the greater number of these failures are due to bad subgrade, and the others to poor workmanship, dirt and dust in the aggregate or poor bonding, because of improper rolling and penetration.

Many of these failures are caused by frost action in the subgrade and by improper drainage, which permits this frost to heave up the surface; or by the gradual accumulation of moisture in poorly drained places in the subgrade, which destroys the support of the wearing surface through no fault of that surface.

Some Successful Instances

I know of one piece of penetration surface in which three experimental sections were laid, each of about 500 feet. In these sections were used trap rock or very hard basalt, limestone, just an average grade, and sandstone of good character, while on all the rest of the road granite of good grade was used. This surface was laid in three layers of 2 inches, 2 inches and 1 inch. Two years after opening, a seal coat was put on, and nothing has been done with it in the last six years. The same materials were used on the seal coat, and I can distinguish no difference at all in these four sections of pavement. This road has carried as many as 400,000 cars and trucks per season of 8 months, and the pavement is in

perfect condition; but it is laid on a perfect subgrade and 18 inches of Telford.

Between the entrance to a ferry slip and the foot of a mile-and-a-half-long hill, brick paved on concrete base, with grades from 5 to 8 per cent, there is a rock fill 300 feet long. As this fill was expected to settle, it was decided to lay a temporary cinder surface on it. Three inches of clean steam cinders were spread and rolled with a 1,000-pound roller, and bituminous binder was applied at the rate of one gallon per yard and lightly covered with more cinders. Two years later another application of $\frac{1}{2}$ -gallon per yard of binder was made and lightly covered with cinders, and at the end of another two years this 300 feet of temporary surface is in perfect condition. More than 330,000 cars and trucks used it during the last 8 months, and yet the crushing strength of cinders is not great.

In eastern Ohio and western Pennsylvania, much slag has been used and, when treated like limestone, has made good surfaces. Many surfaces have been laid with crushed gravel, which is, of course, just like good crushed stone, if properly screened and washed before crushing. The usual speci-

fication for this aggregate requires 60 per cent more of material to have angular fragments, but some surfaces have been laid with gravel without crushing, and when the aggregate was clean, properly sized and bonded, the surfaces have been good. In Massachusetts and other New England states, this uncrushed gravel aggregate has been extensively used in the so-called tar concrete pavements, with success when the workmanship was good. Many old gravel roads have been successfully surfaced with only gravel aggregate. Good workmanship means more in bituminous macadam surfaces than mineral aggregate does.

It would seem much wiser for the engineer to carefully study all available local mineral aggregate and prepare his specifications to permit the greatest possible use of it in his surface, than to fall into the easier method of copying standard specifications and so compelling contractors to import these aggregates and thus greatly increase costs.

Better put this extra money into your subgrade work, for that is really your road.

ACKNOWLEDGMENT.—From a paper read at the Good Roads Congress, Chicago, Ill., January, 1922.

Changes in Road Surfaces

When Adam MacAdam in 1770 developed the road surface which to this day bears his name, he was so far in advance of the age that people demurred at using so expensive and unnecessarily hard a type of surface. To-day we find that macadam paving ranks with the cheaper and "soft" types entirely unsuitable for much of the traffic which passes over it. We must also bear in mind that traffic has changed. The horse-drawn vehicle has almost entirely passed out of existence and has been replaced by the gasoline-propelled vehicle, which carries loads many times in excess of those carried by the horse-drawn type.

The macadam road, like the horse-drawn vehicle, is "out of date," and surfaces are required to-day which will withstand the weight of the present-day traffic, although in some localities where the traffic is no greater in comparison than that of the "horse, mule or ox" age, macadam can still be used with entire satisfaction, as are gravel, sand, clay and other "soft" types.

In the past ten years there has been a great change in the types of roads suitable for traffic conditions on main travelled highways. In 1910, plain and surface-treated macadam were considered among the highest types of paving for country roads, and a large percentage of the mileage was of the two types. There was a small mileage of brick and concrete and a somewhat greater mileage of bituminous macadam, but plain and surface-treated macadam were the predominant types of hard-treated roads. How great the change has been is shown by figures recently issued by the Bureau of Public Roads. On Federal Aid roads completed between 1916 and 1920 only 2.9 per cent of the total area paved was plain and surface-treated macadam. The types which formerly constituted such a small part of the mileage were as follows: bituminous macadam, 3.1 per cent; bituminous concrete, 6.3 per cent; cement concrete, 19.3 per cent; brick, 4.1 per cent.—*Highway News Digest*.

An Infant Hygiene Record Card

By Dr. A. O. Peters
 Commissioner of Health, Dayton, Ohio

DAYTON'S public health nursing service operates with ten nurses of the Visiting Nurses' Association and ten city nurses under the supervision of the Visiting Nurses' Association and the Commissioner of Health. The nurses do all kinds of nursing in their districts except school

work. The card shown below, with a certificate of birth, is taken to the home of every child—whether of well-to-do or of indigent family—whose birth is reported. This gives the nurse entry into every such home, as the infant hygiene record cards can be obtained in no other way.

Division of Health and Visiting Nurses Association

DAYTON, OHIO

INFANT HYGIENE RECORD

Name of Child _____ Address _____ Date of Birth _____ Birth Weight _____

Parents _____ No. of Child _____ Delivered by _____ Instrumental? _____

Eye Prophylactic? _____ Breast-fed? _____ Intervals _____ If bottle-fed, give details _____

Regulation of Light _____ Temp. _____ Ventilation _____ Sanitation _____

Hours of Sleep _____ How Bathed? _____ Stools, Number and Character _____

Is Vaccination intended? _____ Arc regular physical examinations intended? _____ Circumcised? _____

Circumstances _____ Reaction to visit _____ Date of visit _____ Name of Nurse _____

REMARKS: _____

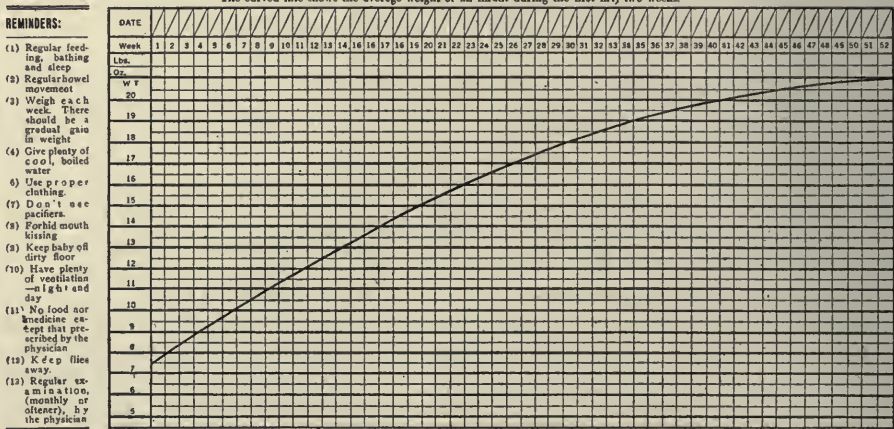
Dates of Re-visits	Name of Nurse	REPORT
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HELP SAVE THE BABIES

Through the co-operation of the medical profession and parents with the Division of Health and the Visiting Nurses Association, the infant death rate in Dayton has been reduced from 124 per one thousand living births in 1913 to 83 in 1920. This is a saving of 130 infant lives every year.

It is well known that any infant death rate above 50 or 60 indicates that some babies are dying from preventable causes. This means that every year Dayton is still losing from 60 to 100 babies whose lives should be saved. Every baby—no matter how well he may seem—needs as constant care TO KEEP HIM WELL as any sick person needs to restore health. If you will faithfully keep the records on this chart for which it provides, it will greatly assist your physician in treating your baby should it become sick and will help him to prescribe proper care to prevent sickness. At any time the visiting nurse will gladly assist you in carrying out the orders given by your physician for the care of your baby. Call Main 2406.

CHART BELOW THE WEIGHT OF YOUR CHILD FROM WEEK TO WEEK AND COMPARE WITH THE AVERAGE CURVE
 The curved line shows the average weight of an infant during the first fifty-two weeks.



- REMEMBERS:**
- (1) Regular feeding, bathing and sleep
 - (2) Regular bowel movements
 - (3) Weigh each week. There should be a gradual gain in weight
 - (4) Give plenty of cool, boiled water
 - (5) Use proper clothing.
 - (7) Don't see pacifiers.
 - (8) Forbid mouth kissing
 - (9) Keep baby off dirty floor
 - (10) Have plenty of ventilation—night and day
 - (11) No food nor medicine except that prescribed by the physician
 - (12) Keep flies away.
 - (13) Regular examination, (monthly or oftener), by the physician

Note in space to the right any illness contracted by your child, giving date, physician's name, if called, and other facts

Making the City Plan Effective

By Leo J. Buettner

Secretary, City Planning Commission, Johnstown, Pa.

IN the early stages of the city planning work in the city of Johnstown, Pa., in the year 1914, the Planning Commission realized that it was necessary to have some sort of guide in its work and requested that the City Council make an appropriation for this purpose. An appropriation was made, and the Commission employed experts to make a comprehensive plan and report of the city of Johnstown and surrounding boroughs.

When these experts started to work, the Commission concluded that the report and recommendations would have to be made in such a way as to appeal to the citizens of the community. With this idea in mind, it was suggested that only Johnstown views be used to illustrate the plan and report; in other words, that photographs be taken of conditions in this city as they existed, and that white lines on the photographs show what was recommended in the way of improvement.

When a citizen of Johnstown opens this book, he immediately recognizes the place where some improvement is planned and also gets an idea of the effect of the improvement. This method of illustrating fixes the proposed change or improvement in the mind of the citizen so clearly that he will not easily forget it. Many other cities are now following with great success this idea of illustrating city planning projects.

The report and plan was printed and distributed among the leading citizens and business men of the city. Unfortunately, however, the Commission made the mistake that many others have made—of not having enough copies of the report printed. It is when the report is first published that citizens are anxious to get copies and are interested in knowing what it contains. After the first edition is exhausted, it is usually hard to get another appropriation to cover the cost of printing additional copies, and the citizens do not display the same degree



JAY-WALKERS, MAIN AND FRANKLIN STREETS, JOHNSTOWN, PA.

1. The source of the trouble: diagonal entrance to Central Park. 2. The remedy: eliminate diagonal entrance; create side entrances; establish permanent pedestrian lanes; introduce semaphore system, illuminated at night. 3. Future car tracks.

of interest that they did when the first edition was being distributed.

In connection with the report and plan, the experts made a large map, 10 x 15 feet in size. This map was erected in the city planning headquarters and covers one side of the room. On this map every recommendation made in the report is shown in colors. The map is one of the best means of educating the people of the city as to the various improvements that have been proposed. The Commission never misses an opportunity of showing this map to the citizens, as this is one of the methods of making the city plan effective. It makes plain the practical side of city planning, and also shows that the comprehensive plan and report of Johnstown does not mean "tying pink ribbons on lamp posts." In Johnstown, as in other cities, a great many people have the idea that city planning means the spending of millions of dollars to create a "City Beautiful." This method of illustrating helps to offset such ideas to a great extent.

The Taxpayers Have to Be "Shown"

It has been found that the taxpayers are always willing to pay the bill provided that they can see what they are getting for their money. The education of the taxpayer is the solution of the whole problem of making the city plan effective. A great many of the proposed improvements in Johnstown, as well as in other cities, will have to be paid for out of funds realized from the sale of bonds. In order to do this in Pennsylvania cities, it is necessary, after a certain percentage of bonded indebtedness has been reached, to get the consent of the electors to increase the bonded indebtedness. By keeping the city plan continually before the electors and showing them the practical side of it, a planning commission makes them thoroughly acquainted with it, and when they are asked to vote in favor of a bond issue to pay for some improvement recommended in the city plan, there is no argument. It must also be remembered that the taxpayers and citizens of our cities are the ones that elect our officials, and, if familiar with the provisions of the comprehensive plan, will support candidates for city and county offices who are pledged to carry out the city plan.

It is always a question of "Why?" with the taxpayer. In order to show the tax-

payer why, Johnstown has a complete set of lantern slides of all the pictures and maps in the comprehensive plan and survey. With these the Commission goes before any club, Sunday school, lodge, social organization, parent-teachers' association, and any other gathering of people who desire to hear about the proposed improvements. This lecture on the comprehensive plan can be had upon application to the Commission, without cost or expense to the organization or gathering. The lectures help to get a great deal of public sentiment back of the plan.

Intelligent Use of Local Newspapers

The newspapers are also a great factor in making the city plan effective. The Johnstown newspapers are to be very highly commended for the splendid manner in which they cooperate with the Planning Commission in giving its recommendations unlimited space and in often commenting editorially upon the recommendations. In giving newspaper publicity to a comprehensive plan, however, great care must be taken in writing the articles and in making statements of the probable cost of the proposed improvement. The best method is to "make haste slowly." It is very easy to scare the citizens of smaller cities regarding the carrying out of the provisions of the comprehensive plan, especially if they see headlines like this: "\$10,000,000 Will Complete City Plan." When an approximate estimate of the cost of any improvement is published in a newspaper, the article should also, if possible, carry with it an approximate estimate of the increased valuation that will result from the proposed improvement. This will show that city planning is really a paying investment. If cities would estimate the increased values of the surrounding properties that are derived by making improvements, there would be little or no trouble in actually carrying out a large number of the proposed improvements within a comparatively short time.

The Schools the Most Effective Ally

All of the foregoing will help to make the city plan effective, but the very best method is the use of the schools. A city planning commission can with a little assistance or cooperation on the part of the school authorities obtain wonderful results. In Johnstown the Commission has been very successful with the plan in the schools. In



STREET OBSTRUCTIONS

1. Actual space between obstructions. 2. Legal width of sidewalk, 13 feet. 3. Cellar entrances, projecting steps. 4. Crates, etc.

the fall of 1920 it was suggested to the superintendent of grammar grade schools that the comprehensive plan be used in the schools in some way so that the pupils as well as the city would get the benefit. As a result the comprehensive plan and survey was adopted by the teachers of the eighth grades as the subject for the study of the English language under the title of "Future Johnstown." This was done in the following manner:

First of all, the Commission held a meeting with the teachers and lectured to them, showing them the various slides. The plan was then divided into six parts as follows:

- Commission, jurisdiction, duties and object
- The plan as a whole
- Thoroughfares
- Rivers and bridges
- Parks and playgrounds
- Municipal buildings

One subject was assigned to each of the six grammar grade schools. Next, the Commission took the slides into the schools and lectured to the children. Each slide was shown and briefly explained. The children were allowed to ask questions, in order to make sure that the pupils understood the proposed improvement thoroughly. Then

the children were taken to the sites of the proposed improvements. Every child was required to make an oral report and later a written report of the improvement. The pupils thus were learning how to use English correctly and at the same time learning the needs of their city. The children wrote original stories about the proposed improvements, as no printed matter was given them. The object of this method was to get the children to ask questions, and this is where the valuable part of the school work came in. Mother, father, sister, brother, relatives and friends were interviewed on these subjects by the little folks. Usually, the adult was not familiar with the plan and gave the child some excuse or put off answering its questions until such time as he could come to the City Hall and find out about the improvement upon which the student desired information. In this way the large map was again used to make friends for the plan.

As the work in the school progressed, speakers were developed, and one of the pupils was selected from each class as its speaker on "Future Johnstown," at the commencement exercises. On the evening of the commencement exercises these pupils gave an illustrated lecture on the needs of

If you see caterpillars stripping willows, poplars, aspens and cottonwoods, don't go by on the other side. Stop and obtain some specimens and mail them in a box, secure against breakage, to your state entomologist, or write and tell him what you have seen.

The satin moths have pure white wings, and their bodies are covered with long white hairs, so that the whole appearance is as of satin. The males are a little smaller than the females, and the body length varies from 15 to 20 millimeters in the male and 20 to 25 millimeters in the female, with the wing expanse varying from 35 to 55 millimeters. In other words, they are almost an inch long and the wings spread from one and a half to two inches in width.

The eggs are laid in conspicuous patches from one-half to one inch in length and are covered with a white secretion. A single female may lay as many as 550 eggs. Most of the egg-laying is done in the middle of July. In Europe these eggs may not hatch until the next spring, but in Massachusetts they were observed to hatch in hot weather in about 15 days.

The larvae have many tubercles bearing long hairs and are conspicuously marked with large whitish patches on the dorsum of the segments. The young larvae feed on the epidermis of the leaves, giving them a skeletonized appearance. When they reach about the third stage of development, they construct little silken hibernating pockets in the crevices of the bark, and here they remain dormant until the spring foliage comes out, when they appear and feed until fully developed in June or July. They seek shelter and construct cocoons on the trees or sides of houses. The pupal stage lasts about nine days. The first moths have been observed in New England about July 2, and from then on they become very abundant.

The new bulletin is entitled, "The Satin Moth: An Introduced Enemy of Poplars and Willows," by A. F. Burgess, U. S. Department of Agriculture, Department Circular 167, May, 1921, and can be obtained on application to the Bureau of Entomology, Washington, D. C. It was not primarily the purpose of this article to discuss the new pest, but rather to draw a lesson from its arrival and establishment.

The Menace of Foreign Pests

The whole record of American shade tree troubles proves to us that our trees are most

endangered by the foreign importations. It seems to be a biological law that a pest escaped from its natural environment and its normal enemies, and transplanted into a favorable climate with the proper food, will become far more serious than in its native habitat.

We have but to mention again the gipsy moth, which came to America about thirty years ago, and the brown tail moth, which appeared a little later; these two species nearly devastated the trees of New England, and were fast advancing on New York when vigorous measures were taken to suppress them. We will cite the elm leaf beetle, the willow leaf beetle, the Japanese beetle, the horse chestnut borer, the San José scale, and many other scales, the pine shoot moth, the elm sawfly, the poplar borer, the poplar curculio, as prominent among the forest and shade tree pests that have come to our shores uninvited and taken possession of our priceless heritage.

In 1917 the writer edited for the Department of Agriculture a volume known as the "Manual of Dangerous Insects Likely to Be Imported." The purpose and intent of this volume was to call the attention of our American authorities to the numerous pests of Europe, Asia, Africa, Australia and South America which might in our great extending commerce reach our shores and become pests. The time is coming when our nation must have outposts in all lands whence come our imports, stationed there to observe the dangerous pests and warn our authorities, as well as guard our commerce by preventing the importation of dangerous products. Such action will have the wholesome effect of forcing importing nations to effect control of their pests in order to save their commerce.

The Need of Local Vigilance

This event must emphasize more than ever the need of national, state and municipal vigilance, if we are to save for future generations the trees we love so well. It will not do to rely on the meager Federal and state appropriations to keep pests from reaching our shores and spreading. Every city must have expert forces constantly engaged in watching and caring for its trees and shrubbery. They must be men who know what to guard against and what they must do in emergency.

Pest control is a highly developed science.

At present it involves a tremendous amount of technical training. No two pests can be controlled in exactly the same manner, and the entomologist must know the different methods available and exercise his judgment and past experience in meeting the tree problems under his jurisdiction.

The glory of every city is the mantle of green formed by its shade trees, those blessed companions of man, which give him shade and shelter and relieve his eye-strain caused by the glare of city streets. The trees are the most important agency in clarifying the atmosphere. They are the pride of the householder, the models of the artist, the inspirers of the poet.

Such of our cities as have become congested and pushed their house lines on the sidewalks, long since found the absolute necessity of creating frequent breathing spaces, where green grass and beautiful trees could be grown, to give relief to the dweller in the closely packed sections.

The parks are the resting-places of the populace. Residential sections with parkings of trees are the most highly prized by home owners, and, in fact, the presence of a beautiful tree on a property is a distinct asset from the real-estate standpoint.

If the citizens prize the trees so highly, why are our cities often so negligent of the health of their shade trees? When a member of our family is sick, we call in a specialist and expect him to cure the disease. For every trouble we consult men who know what to do, except when our trees are in danger; then we seem to pass the responsibility on to some one else, or shrug our shoulders, and say, "It is too bad"—but in many cities no action results. That is why these new pests get a strangle-hold on the



POPLARS IN A MASSACHUSETTS TOWN, DENUED BY THE SATIN MOTH

nation. If the men of Watertown and Cambridge who observed the satin moth in 1918 and 1919 had truly done their duty, we should not have in New England a pest threatening the poplars and willows of America.

The control of your shade tree pests should be confided only to reputable technical men who can show by diploma or other credential that they are qualified as experts to handle these problems. Every different species of tree has its own distinct types of pests. All of the pests of a single tree cannot be handled by any one or two standard methods, nor can they all be reached at the same time of the year. Only certain pests can be reached by lime-sulphur sprays; some must be treated with nictines, arsenicals, oils, etc.; some must be guarded against by banding; others work in the heart of the tree or branch and present extremely serious problems. Who but a technically trained man can be expected to know how to go about solving these problems and effecting control?

What Is a Fair Salary for a City Clerk?

THE following tables, prepared from a questionnaire sent out by THE AMERICAN CITY, cover a distribution of replies wide enough to give a fair idea of the current salaries of city clerks. It is difficult to compare the salaries of city clerks. Their duties differ considerably in various localities, making it necessary to be careful not to draw hasty conclusions from these figures.

Among the large cities reporting, Minneapolis, Minn., pays the highest salary—\$4,500. Pittsburgh, Pa., which is larger than Minneapolis, pays but \$3,600. There are considerable differences in the salaries paid in the cities of about 100,000 population: Lawrence, Mass., \$2,800; Lowell, Mass., the same; Trenton, N. J., \$2,400; Oklahoma City, Okla., \$3,000; Erie, Pa., \$2,500; Reading, Pa., \$2,400; Scranton, Pa., \$2,300; Nashville, Tenn., \$3,000. Wide divergences appear in the 75,000 group. Sioux City, Ia., reports \$175 a month, a rate of \$2,100 a year; Wichita, Kans., \$2,400; Holyoke, Mass., \$3,000; St. Joseph, Mo., \$1,800; Allentown, Pa., \$2,000; Charleston, S. C., \$2,400. In the 30-50,000 group are such figures as that of Stamford, Conn., \$3,500, which compares favorably with the salary paid in much larger places; Decatur, Ill., \$1,800 and fees; Gary, Ind., \$3,000; Lewiston, Me., \$1,800; Salem, Mass., \$2,400; Bay City, Mich., \$2,000; Jackson, Mich., \$2,500; and Lansing, Mich., \$2,400. It is interesting to note that Montclair, N. J., pays \$3,900, while Orange, N. J., slightly larger, pays but \$2,400, and Union, N. J., with a still smaller population, \$4,000.

In the smaller cities and towns comparison is very difficult. In most villages, and in many places of considerable size, the city clerk is expected to devote only a portion of his time to the duties of that office. For instance, in Chillicothe, Ohio, the city clerk draws no salary as such, his office being combined with that of city auditor. In fact, combinations of offices are frequently met, although these are not indicated on the tables. A few of the typical ones may be noted, as they may suggest feasible combinations for other cities:

In Weiser, Idaho, the city clerk is also

police judge. In Hymera, Ind., his office is combined with that of city treasurer; in Atlantic, Iowa, which pays \$290 a month, he is also superintendent of utilities. In Tipton, Ia., he is weight master and collector. Combinations of the offices of city clerk and city auditor or city treasurer are common. In Westfield, Mass., the city clerk is also clerk of registrars; in Forsyth, Mont., city attorney; in West View, Pa., street commissioner and building inspector; in Orange, Texas, city treasurer, tax assessor and collector. City clerks act as city purchasing agents in many places, among which may be mentioned Tekoa, Wash., Aliquippa, Pa., Farrell, Pa. Two cities report that the city manager performs the duties of city clerk: Franklin, N. Y. (where he is also purchasing agent), and Blackstone, Va. In places of small size, where there are a number of duties no one of which requires full time, and yet where each requires considerable attention, such combinations work out very well and are to be recommended.

A number of cities report that the city clerk is partly paid from fees or commissions of various sorts. Welsh, La., Bar Harbor, Maine, and Bath, Maine, report that the clerk is paid no regular salary, but receives fees only.

SALARIES OF CITY CLERKS

UNLESS OTHERWISE STATED, FIGURES REPRESENT YEARLY SALARY

State and City	Population	Over 10,000	Under 10,000
ALABAMA			
Albany	7,652		\$ 180 m*
Brewton	2,682		45 f**
ARIZONA			
Bisbee	9,205		200 m
Globe	7,044		200 m
Mesa	3,036		250 m
Miami	6,689		105 m
Prescott	4,300		225 m
Tucson	20,292	\$2,400	
CALIFORNIA			
Grass Valley	4,006		1,320
Huntington P'k.	4,513		150
Sawtelle			50
COLORADO			
Durango	4,116		2,100
Greeley	10,833	125 m	
Monte Vista	2,367		400
Montrose	3,581		110
Paonia			100 m

* m—per month.

** f—plus fees.

State and City	Population	Over 10,000	Under 10,000	State and City	Population	Over 10,000	Under 10,000
Pueblo	42,908	2,280		Douglas			50 m
Rocky Ford	3,746		300	Ellis			600
Salida	4,689		125 m	Fort Scott	10,693	125 m	
Trinidad	10,906	150 m		Fredonia	3,954		100 m
CONNECTICUT				Harper			75 m
Stamford	35,056	3,500		Hays	3,165		140 m
Torrington	20,623	37.50 wk.		Hillsboro			35 m
FLORIDA				Hoisington	2,395		75 m
Miami	29,549	150 m		Horton	4,009		100 m
Miami Beach			225 m	Hutchinson	23,298	1,800	
GEORGIA				Kinsley			60 m
Perry			60	Leharon			65
Thomasville	8,196		135 m	Marion			85
Valdosta	10,783	150 m		Marysville	3,048		75 m
IDAHO				Olathe	3,268		100 m
Lewiston	6,574		160 m	Ottawa	9,018		1,500
Paris			400	Parsons	16,028	1,800	
Payette			1,200	Peabody	2,455		50 m
Rexburg	3,569		1,800	Pittsburg	18,052	1,800	
Wallace	2,816		1,000	Protection			37.50 m
Weiser			145	Stafford			150 m
ILLINOIS				Troy			420
Abington	2,721		1,200	Weir	1,945		300
Arlington H'ts.			125	Wellington	7,048		125 m
Carbondale	6,267		100 m	Wichita	72,217	2,400	
Clinton	5,898		600	Wilson			25 m
Decatur	43,818	1,800 f		KENTUCKY			
Eureka			200	Cynthiana	3,857		95 m
Golconda			50 f	Hickman	2,633		150
Harvard	3,294		25 m	Somerseset	4,672		300
La Grange			70 m	LOUISIANA			
La Grange P'k.			250	Colfax			75
Mascoutah	2,313		300	Donaldsonville	3,745		40 m
Mound City	2,756		100 mf	Thibodaux	3,526		120
Oregon	2,227		1,500	Vivian			15 m
Princeton	4,126		165 m	Welsh			fees only
Zion	5,580		900	MAINE			
INDIANA				Bar Harbor	3,622		fees only
Covington			450	Bath	14,731	fees only	
Crown Point	3,232		500	Brewer	6,064		520 f
Frankfort	11,585	1,000		Lewiston	31,707	1,800	
Gary	56,375	3,000		MARYLAND			
Hymera			180	Chestertown	2,537		420
Mishawaka	15,195	1,700		Easton	3,442		1,500
Mt. Vernon	5,284		850	Port Deposit			50
Salem	2,836		200	Westport	2,977		300
Tell City	4,086		250	MASSACHUSETTS			
Winchester	4,021		700	Attleboro	19,731	1,800	
IOWA				Blackstone	4,836		75 f
Afton			100 f	Dracut	5,280		200
Atlantic	5,329		290 m	Gloucester	22,947	1,500	
Belle Plaine	3,887		115 m	Holbrook	3,161		200
Chariton	5,175		90 m	Holyoke	60,203	3,060	
Cherokee	5,824		900	Lawrence	94,270	2,800	
Clear Lake	2,804		20 m	Lowell	112,759	2,800	
Elkader			100	Ludlow	7,470		600
Fort Madison	12,066	1,800		Montague	7,675		400 f
Glenwood	3,862		300	Marblehead	7,324		about 800
Guthrie Center			35 m	Melrose	18,204	1,800	
Hawarden	2,491		175 m	Millbury	5,652		200
Humboldt			200	Northbridge	10,074	35 m	
Manchester	3,111		130 m	Pepperell	2,468		200
Muscatine	16,068	1,500		Salem	42,515	2,400	
Oelwein	7,455		70 m	Sutton	2,578		100 f
Osceola	2,684		400	Taunton	37,137	2,500	
Perry	5,642		100 m	Uxbridge	5,384		800
Rock Rapids	2,172		150	Westfield	18,603	2,000	
Sheldon	3,488		150 m	Weymouth	15,057	250 f	
Shenandoah	5,255		125 m	Williamstown	3,707		300
Sidney			50	Winchester	10,391	812.50	
Sioux City	71,227	175 m		Winthrop	15,446	520 f	
Spirit Lake			600	MICHIGAN			
Tama	2,601		175	Allegan	3,637		150 m
Tipton	2,142		135 m	Alma	7,542		3,000
KANSAS				Bay City	47,554	2,000	
Anthony	2,740		150	Bessemer	5,482		1,800
Baldwin City			70 m	Big Rapids	4,558		1,200
Cherryvale	4,698		110 m	Blissfield			100
Coffeyville	13,452	135 m		Cadillac	9,734		2,000
Conway Springs			60	East Jordan	2,428		85 m
Dodge City	5,061		1,800	Hancock	7,527		135 m
				Harbor Beach			1,500
				Holland	12,166	2,600	

State and City	Population	Over 10,000	Under 10,000	State and City	Population	Over 10,000	Under 10,000
Iron Mountain	8,251		150 m	Cape May City	2,999		1,000
Ishpeming	10,500	1,000		Edgewater	3,530		1,500
Jackson	48,374	2,500		Englewood	11,627	1,200	
Jonesville			300	Frenchtown			150
Lansing	57,327	2,400		Jamesburg	2,671		150 f
Ludington	8,810		1,800	Long Branch	13,521	1,500	
Marine City	3,731		1,200	Madison	5,523		2,100
Marquette	12,718	125 m		Milltown			400 f
Menominee	8,907		1,640.16	Montclair	28,810	3,900	
Niles	7,311		1,800	Orange	33,239	2,400	
Royal Oak			2,400	Plainfield	27,700	3,000	
St. Clair	3,204		1,200	Princeton	5,917		900
Sparta			10 m	Roselle Park	5,438		500
Wyandotte	13,851	2,400		Salem	7,435		500
MINNESOTA				Summit	10,174	1,000	
Bertha			35	Trenton	111,289	2,400	
Jackson	2,144		40 m	Union	20,651	4,000	
Le Sueur			37.50 m	Westfield	9,026		1,000
Minneapolis	380,582	4,500		Wildwood			840 f
Renville			180	NEW MEXICO			
St. Charles			100	Albuquerque	15,157	125 m	
MISSISSIPPI				Deming	3,212		300 f
Amory	2,861		125 m	NEW YORK			
Pontotoc			45 m	Adams			250
Tupelo	5,065		85 m	Auburn	36,192	2,700	
MISSOURI				Babylon	2,523		350
Butler	2,702		fees only	Brewster			125
Carthage	10,068	125 m		Canton	2,631		150
Charleston	3,410		300 f	Catskill	4,728		600
Columbia	10,379	100 m		Cazenovia			600
Farmington	2,886		fees only	Champlain			100
Greenfield			200	Clinton			150
Harrisonville	2,073		150	Clyde	2,528		100 f
Higginsville	2,724		35 m	Cuba			180
Joplin	29,902	150 m		East Aurora	3,703		500
Monroe City			75	Floral Park			400
Poplar Bluff	8,042		1,200 f	Glens Falls	16,638	1,100	
St. Joseph	77,939	1,800		Groton	2,235		1,200
Sarcoixie			2.50 m	Haverstraw	5,226		400
Sedalia	21,144	1,800		Hempstead	6,382		2,200
Sikeston	3,797		70 m	Homer	2,356		150
Slater	3,797		400	Hudson	11,745	1,500	
MONTANA				Jamestown	38,917	1,900	
Big Timber			50 m	Kenmore	3,160		0 m
Forsyth			500	Ncwalk	6,964		40 m
Glasgow	2,059		125 m	Newburgh	30,272	2,500	
Glendive	3,816		75 m	New Paltz			125
Great Falls	24,121	200 m		Niagara Falls	50,760	3,300	
Havre	5,429		50 m	Norwich	8,269		300
Red Lodge	4,515		60 m	Ogdensburg	14,609	1,800	
Kalispell	5,147		1,500	Olean	20,506	2,100	
Livingston	6,326		175 m	Phelps			175
Miles City	7,937		2,000	Philmont			75
Roundup	2,409		300	Port Chester	16,572	1,500	
Whitefish	2,867		1,200	Poughkeepsie	35,000	2,500	
NEBRASKA				Salamanca	9,276		1,700
Bloomfield			300	Saratoga Springs	13,181	500	
Clay Center			50 m	Scotia	4,358		1,600
College View	2,249		110	Sherburne			600
Crawford			300	Sherrill			125
Grand Island	13,960	1,200		Sidney	2,670		240
Hebron			150	Walton	5,425		300
Loup City			200	Waterloo	3,809		200
McCook	4,303		300	Watertown	31,285	1,650	
Norfolk	8,634		100 m	NORTH CAROLINA			
Osceola			300	Asheville	28,504	3,000	
Ralston			150	Canton			60 m
Stromsburg			100	Edenton	2,777		1,400
Wahoo	2,338		250	Gastonia	12,871	2,100	
Wayne	2,115		300	Hickory	5,076		3,000
Wilber			300	King's Mt.	2,800		100 m
NEVADA				Raleigh	28,674	2,600	
Reno	12,016	175 m		Reidsville	5,333		150 m
Sparks	3,233		60 m	Salisbury	13,884	1,800	
NEW HAMPSHIRE				Waynesville	1,943		250
Berlin	16,104	1,400 f		NORTH DAKOTA			
Concord	22,167	1,400		Cassclton			300
Franklin	6,318		1,500	Enderlin			200
Milford	3,783		200	Hillsboro			35
NEW JERSEY				Jamesstown	6,627		1,800
Asbury Park	12,400	1,500		Landon	1,223		250
Belvidere			200	Lidgerwood			200
				Lisbon			40 m
				Oakes			50 m
				Wahpeton	3,069		600

State and City	Population	Over 10,000	Under 10,000	State and City	Population	Over 10,000	Under 10,000
OHIO							
Arcanum			250	Narbutb	3,704		100
Barnesville	4,865		300	Northampton	9,349		20 m
Bellefontaine	9,336		1,500	Oakmont	4,512		400
Bowling Green	5,788		1,490	Perkasie	3,150		300
Brookville			200	Pitcairn	5,738		1,800
Cheviot			900	Pittsburgh	588,193	3,600	
Chillicothe	15,831		none†	Reading	107,784	2,400	
Cleves			150 m	Sayre	8,078		500
Delaware	8,756		1,700	Scranton	137,783	2,300	
Elyria	20,474	1,500		Shenandoah	24,726	1,100	
Granville			200	Spangler	3,035		125
Huron			175	Susquehanna	3,764		300
Kenmore	12,683	1,800		Swoyersville	6,876		360
Kent	7,070		1,800	Uniontown	15,609	1,950	
Lebanon	3,396		900	Washington	21,480	2,200	
McConnellsville			30 m	West View			180 m
Mansfield	27,824	2,400		Wrightsville	1,043		75
Mt. Gilead			30 m	Youngsville			20 m
Ottawa			260	RHODE ISLAND			
Painesville	7,272		none	Pawtucket	64,248	3,750	
Sandusky	22,897	960		Warren	7,841		750 f
Vermillion			360	SOUTH CAROLINA			
OKLAHOMA							
Anadarko	3,116		1,200	Bamberg	2,210		80 m
Blackwell	7,174		2,400	Barnwell			900
Boley			20 m	Bennettsville	3,197		151.67 m
Broken Arrow	2,086		75 m	Branchville			300
Edmond	2,452		100 m	Charleston	67,957	2,400	
Lawton	8,930		1,800	Darlington	4,669		1,800
Madill	2,717		125 m	Greenwood	8,703		1,680
McAlester	12,095	2,100		Orangeburg	7,290		190 m
Muskogee	30,277	2,500		Valhalla	2,088		25 m
Oklahoma City	91,258	3,000		SOUTH DAKOTA			
Poteau	2,679		25 m	Aberdeen	14,537		165 m
Sapulpa	11,634	2,100		Canton	2,225		300
Stigler			125 m	Clark			1,500
Stillwater	4,701		1,800	Elk Point			200
Tahlequah	2,271		40 m	Flandreau			300
OREGON							
Eugene	10,593	140 m		Highmore			450
Grant's Pass	3,151		1,020	Huron	8,302		2,400
Klamath Falls	4,801		175 m	Mitchell	8,478		2,100
La Grande	6,913		135 m	Platte			150
Pendleton	7,387		125 m	Watertown	9,400		1,890
Seaside			1,700	TENNESSEE			
Tillamook			150 m	Bristol	8,047		1,800
Woodburn			100 m	Dyersburg	6,444		2,000
PENNSYLVANIA							
Aliquippa			65 m	Harriman	4,019		1,200
Allentown	73,502	2,000		Nashville	118,340	3,000	
Bangor			370	TEXAS			
Berwick	12,181	500		Beaumont	40,422	3,000	
Bradford	15,525	2,500		Brady	2,197		110 m
Bridgeville			250	Brownsville	11,791	160 m	
Bristol	10,273	400		Bryan	6,307		175 m
California	2,480		300	Corsicana	11,356	125 m	
Cambridge Springs			360	Crockett	3,061		50 m
Catawissa			460	Del Rio	10,589	125 m	
Chambersburg	13,171	1,800		Denison	17,065	175 m	
East Bangor			175	Flatonia			20 m
East Stroudsburg	4,855		60 m	Galveston	44,255	2,400	
Ebensburg			120	Karnes City			25 m
Ellwood City	8,958		170 m	Longview	5,713		185 m
Emaus	4,370		25 m	Marshall	14,271	175 m	
Erie	93,372	2,500		Memphis	2,839		360
Farrell			140 m	Mineral Wells	7,890		1,500
Franklin	9,970		2,000	New Braunfels	3,950		2,000
Greenville	8,191		1,560	Orange	9,212		225 m
Harrisburg	75,917	2,100		Paris	14,040	200 m	
Hawley			50	Pilot Point			750 m
Indiana	7,043		400	San Maria	4,527		900
Ingram	2,900		300	Seymour	2,121		fees only
Johnsonburg	5,400		35 m	Terrell	8,349		125 m
Kennett Sq.	2,398		150	Texarkana	11,480	150 m	
Landsdowne	4,797		600	Tyler	12,085	190 m	
Lititz	3,680		120	Vernon	5,142		2,400
McDonald	2,751		400	Weatherford	6,203		600
McKeesport	45,975	1,800		Yoakum	6,184		1,500
McSherrystown			35	UTAH			
Malvern			150	Cedar City	2,462		400
Meadville	15,563	2,000		Logan	9,439		175 m
Mifflinburg			1,500	Parowan			125
Montrose			75	VERMONT			
† Office of city clerk combined with that of city auditor.							
				Hardwick	1,550		1,100
				Lyndonville	3,558		25 m
				Montpelier	7,125		2,000

State and City	Population	Over 10,000	Under 10,000	State and City	Population	Over 10,000	Under 10,000
Newport	4,976		2,100	Ritzville			900
Northfield	3,096		100	Tekoa			40 m
Springfield	5,283		800	Wenatchee	6,324		200
VIRGINIA				WEST VIRGINIA			
Bristol	6,729		150 m	Clarksburg	27,869	2,400	
Chase City			none	Elkins	6,788		1,400
Cape Charles			300	Martinsburg	12,515	1,500	
Chatham			60	Moundsville	10,669	1,500	
Covington	5,623		1,500	Wheeling	54,322	3,000	
Falls Church			10 m				
Newport News	35,506	3,000		WISCONSIN			
Norton			10 mf	Alma			200
Suffolk	9,123		1,100	Bloomer			200
West Point			12	Chilton			600
				Clintonville	3,275		900
WASHINGTON				Madison	38,278	2,400	
Bremerton	8,918		150 m	Manitowish	17,563	2,700	
Davenport			900	Nekoosa			250
Everett	27,644	175 m		Park Falls	2,676		60 m
Garfield			25 m	Phillips			600
Pullman	2,440		100 m	Sheboygan	30,955	1,500	
Puyallup	6,271		45 m				

The Smoke Problem in Cities

The Elimination of Smoke a Municipal Problem in Which Federal Help is Assured

MUNICIPAL authorities or organizations in New Orleans, Kansas City, Salt Lake City, Akron and Springfield, Ohio, and many other large cities are taking active steps in fighting the smoke evil. Smoke is the unsightly and offensive resultant of improper combustion and is damaging to both health and property. The prevention of objectionable smoke in the manufacturing and business centers of large cities is a problem that cannot be easily solved, and at present no city which uses a considerable quantity of bituminous coal is free from smoke. The cities of the East, however, have avoided this problem by a general use of the smaller sizes of anthracite coal. For this reason it is not surprising that the greatest improvement in the methods of burning bituminous coal has been made in the Central and Western States.

The smoke problem is nearly as old as civilization itself, for coal was being mined in Great Britain about the tenth century. In 1306, Edward I issued a proclamation prohibiting the burning of coal in the city of London, because of the "sulferous smoke and savour of the firing." In 1648 the people of London petitioned Parliament to prevent the importation of coal into the city. Beginning about 1750, when steam was applied to industrial purposes, coal began to be used more extensively, and consequently smoke became more abundant. In 1819, the government appointed a House of Commons' committee to inquire into the

matter, and another committee was appointed in 1843. Two reports were issued in 1843 and 1845, but no legislation resulted. Other investigations were made in 1846, 1854 and 1866, and finally in 1875 the Public Health Act was passed, dealing with the question of smoke.

In the United States the problem, of course, did not appear so early, but as cities of considerable size developed here, the problem was also felt. It has been the subject of discussions, finally becoming of such importance that extensive investigations were made in Pittsburgh, Chicago and Salt Lake City by the U. S. Bureau of Mines. The Salt Lake City investigation was described in some detail in the July, 1920, issue of *THE AMERICAN CITY*.

Smokeless combustion requires the maintenance of a uniform and proper supply of fuel and air under conditions of suitable temperature, mixing, and volume of combustion space. The one word "uniformity" embraces most of the ideals for smokeless combustion. There are available for power-plants, both municipal and private, a variety of designs of mechanical stokers that, when properly operated, will result in smokeless combustion. When improperly operated, however, the mechanical stoker will produce smoke just as abundantly as improper hand-firing. In some parts of the United States where the coal mostly in use is one that easily produces smoke, the smoke from household fires becomes a nuisance. Salt Lake City is an example of such a place.

Saving Roads From Impact

The Importance of Surface Finish and Methods of Maintaining It

By H. Eltinge Breed

Consulting Engineer, New York City

IN an economically designed concrete road, the life of the pavement depends as much upon the surface finish as upon any other factor. We know that impact is the great cause of destruction of our pavements. As a smooth cylinder is rolled along a smooth table there is practically no impact, but if there are ridges in the table, and the cylinder bumps along over them, there will be such a series of impacts that, if the cylinder be heavy enough and be rolled often enough, the surface will be worn out and the table damaged.

That is analogous to what is happening to our roads. If the wheels of the vehicles are smooth and the pavement surfaces smooth, there is no damaging impact from traffic. The road lasts, even though it be weak in proportion to the volume and weight of traffic it must carry. If surface irregularities develop, the whole pavement, no matter how strongly built, soon shows the effects of wear. Our roads are built usually to withstand a pressure of 800 pounds per lineal inch of tire, yet if a $\frac{1}{4}$ -inch obstruction occurs in the surface, the impact of one rear wheel of a 5-ton truck may exert an impact pressure of 20,000 pounds upon the road. Under such pressure the unevenness becomes a depression, whose edges spall and break, causing further impact and more depressions until the pavement is badly damaged.

Causes of Uneven Pavement Surfaces

There are five general causes of uneven surfaces in pavements:

1. Foreign materials in the aggregate, which, failing to amalgamate, are thrown out, leaving holes and depressions.
2. Non-uniform aggregates, which cause inequalities in wearing resistance to traffic, and subsequent depressions in the weaker places.
3. Poor workmanship in striking off and finishing concrete pavements.
4. Cracks, longitudinal and transverse, due to frost action, changes of temperature, or unequal bearing in the subsoil.

5. Uneven joints, perhaps the most common cause of surface troubles, due often to the piling up of joint material or to a difference in elevation of slab surfaces.

Three Maintenance Methods

Three general methods of preserving good surface finish, once it is obtained, are the use of steel reinforcements, the division of the road longitudinally, and the wider spacing of joints with the use of dowels.

The chief advantage of steel reinforcing is that it gives the road greater bearing power and greater resistance to frost action. It also offsets irregularities and weaknesses in subsoil. By helping to preserve the integrity of the pavement, it minimizes any tendency towards cracking, which is, of course, a cause of surface unevenness.

The division of the road longitudinally increases its beam strength about four-fold. Observation has shown that longitudinal cracks are not found in slabs 9 or 10 feet wide, although they are encountered in practically all slabs beyond that width. The reason for this difference is still a matter of conjecture, but until it is ascertained, highway engineers should be guided by results hitherto obtained and build their concrete roads in two longitudinal sections.

Since transverse joints are a prolific source of trouble, it is well to diminish their number as far as possible through the use of longer slabs. This wider spacing of joints becomes feasible through the use of steel reinforcement to meet the temperature stresses of the slab. The use of dowels gives stability to the joints and holds the surfaces even. The submergence of joints an inch below the surface has proved unsatisfactory. This method was devised at first to secure a smooth surface and to permit the use of a finishing machine, and it seemed admirable until subsequent expansion crowded and crushed the concrete above the joint material, leaving a badly ravelled and spalled joint. The best method of making the joint is to submerge the joint material until after the screed or finishing machine has passed over it, then to lift the

joint material slightly above the surface with long-fingered tongs, following this by finishing the joint with a split float or split roller, rounding the concrete next to the joint material with an edging tool.

Specific application of these general principles is found in the requirements for the special concrete highways in Delaware, Pennsylvania and New York. The specifications exact good workmanship by allowing a maximum of only $\frac{1}{4}$ -inch depression in 10 feet of pavement tested with a straight edge. The use of a straight edge on green concrete indicates depressions to be rectified, and insures good results. These states specify materials with such precision as almost certainly to preclude the use of non-uniform aggregate or of foreign materials in the aggregate. The roads are designed so as to minimize the danger of movement in the slab, and the resulting cracks. Special attention is given to the placing of joints and to the suitability of the machinery in use.

All these precautions were taken on concrete roads built last summer in old Bennington, Vt., by the Fred T. Ley Company, Springfield, Mass., and so far not the slightest indication of any surface unevenness has appeared. This tends to support the belief that it is possible, within necessary financial limits, to build roads that will be practically indestructible under the traffic permitted by law.

Proper Method of Finishing

The actual method of finishing is, of course, important in securing a smooth surface. Some road builders prefer to use the finishing machine with the roller and belt. It is essential that the roller be light. A too-heavy roller pushes the crown out of the pavement and spoils the surface. Most specifications call for a weight of from 12 to 15 pounds per foot length. Some builders omit the roller, using only the machine. I believe that the roller helps. One advantage of the finishing machine is that dryer concrete can be used with it, which gives greater strength to the pavement. It gives also more uniform results than can be obtained with a green gang, and seems in general more fool-proof than the hand method. Still, many engineers and contractors prefer to strike-off with the hand screed, using the roller and belt. This has the advantage of eliminating one piece of plant, and if a heavy screed is used in the hands of competent workmen it gives as smooth a finish to the surface as the finishing machine.

With either method the board belt gives unquestionably the better finish. The bow belt, however, can give good results. Proper belting takes off not only the water, but also the clay, loam, laitance, etc., that tend to form scale on the surface.

ACKNOWLEDGMENT.—From a paper read before the convention of the American Road Builders' Association, Chicago, Ill., January, 1922.



A CONCRETE CROSSROADS WITH CLEAR VISTAS AND WIDE RADIUS CURVES
TO REDUCE ACCIDENTS

Forward Steps in Municipal Affairs

Public Welfare Departments

Saving Money on Public Works

ST. PAUL, MINN.—This city has in operation a system of conducting its public works which has proved remarkably successful as a money-saver.

The Chief Engineer submits an estimate to the Contract Committee as to what the job should cost. Then bids are publicly asked for, received and tabulated. If the lowest bid is less than the estimate, the contract is usually awarded to the lowest bidder. If the bids are higher than the estimate, the work is done by Force Account. On all Force Account work done so far under the present administration, the costs have ranged under the lowest bid received.

St. Paul has a municipally owned asphalt plant, and 10 cents a square yard is charged against the job for depreciation of equipment. This is expended in the maintenance and up-keep of the asphalt plant.

The following table gives an idea of costs, when paving by Force Account:

PAVING BY FORCE ACCOUNT		
KIND	Sq. Yds.	Cost
Sheet asphalt	16,952	\$54,308
Asphalt concrete	11,544	50,957
Brick	15,918	74,490
Creosote blocks	14,103	78,833
Tarvia	13,240	23,288
Totals	71,757	\$281,876

Miscellaneous works, such as sewer and water connections, and drainage to be done in connection with the paving, came to \$81,544, giving a grand total of \$363,420.

A comparison with similar work done by the city under contract is interesting:

PAVING BY CONTRACT		
KIND	Sq. Yds.	Cost
Sheet asphalt	63,119	\$162,597
Brick	35,400	191,196
Concrete reinforced	66,355	160,076
Creosote blocks	41,362	262,370
Totals	206,236	\$776,239

On three jobs for which the city asked bids, and for which the final costs have now been compiled, the following figures furnish interesting comparisons:

Actual cost, exclusive of water and sewer connections	\$42,037.79
Engineer's estimated cost	57,800.00
Contractor's bid price plus 2 per cent added for inspection as required by the city charter	57,810.54

This gives a total saving on the Engineer's estimate of \$15,762.21, and on the contractor's bid of \$15,772.75.

It will be noted that the contractor's bid calls for 2 per cent additional for inspection. This, of course, is not sufficient to cover the inspection cost. However, it is a charter provision that only 2 per cent can be added and the balance must be paid out of the Inspection Account of the Permanent Improvement Revolving Fund. The total saving to the city is therefore really greater than the figures given above.

The Force Account system has also made it possible for the city to get much keener competition from contractors, as it is known that they are obliged to bid not only against other contractors, but against the city as well.

H. C. WENZEL,
Commissioner of Public Works.

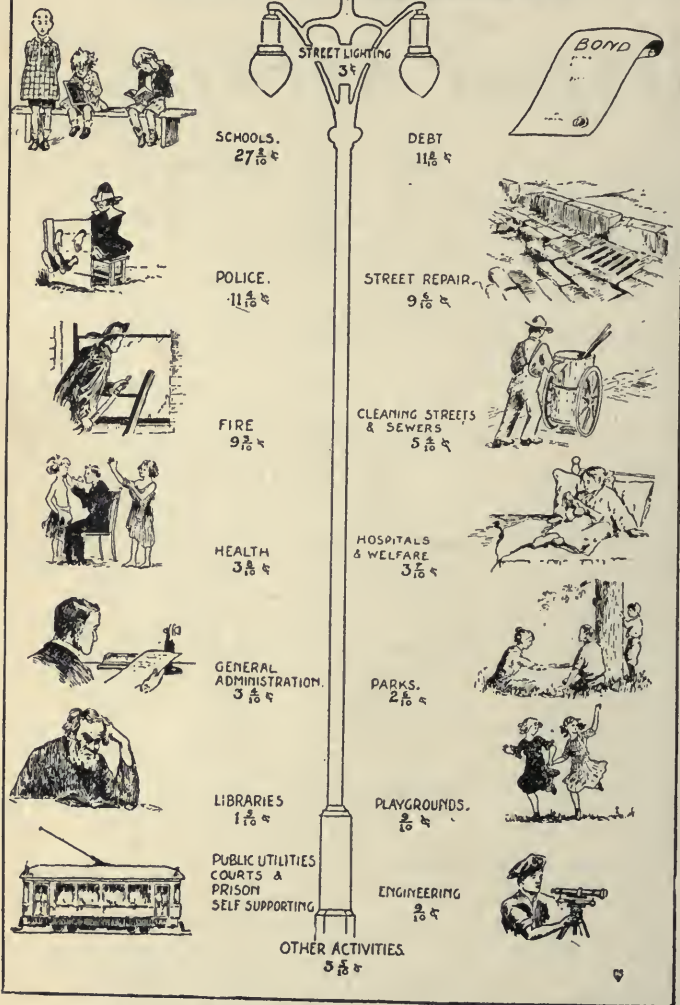
Finance Departments

"Your Tax Dollar"

DETROIT, MICH.—The accompanying chart was prepared to visualize for the citizens of Detroit the services they receive for their tax dollar. An informed citizen body is the strongest guarantee for good government.

It has been stated repeatedly in the pages of THE AMERICAN CITY that a municipal budget is a financial statement of the work program of the city—the activities to be undertaken, their cost, and how they are to

YOUR TAX DOLLAR IS SPENT FOR THE FOLLOWING SERVICES



A GRAPHIC PRESENTATION OF THE DETROIT BUDGET

The manner of financing the entire program is carefully estimated, as follows:

Taxation	\$40,164,706
Bond issues	12,981,577
Miscellaneous income—	
Cash balances,	
sales of products	
and services by de-	
partments, primary	
school money, fines,	
licenses, permits,	
etc.	12,193,351
Total	\$65,339,634

In general, the following points relative to Detroit's budget procedure should be noted:

1. The budget includes all activities of the city for the year (exclusive of public improvements previously authorized either by Council or by the people, local improvement work, and trust funds).
2. The need and opportunity for public service are considered first, and, when determined, the means are provided for financing these services.
3. The activity is the basis of the request. For example, for the police department the costs of street patrolling, traffic control, public safety work, harbor duty, detectives, etc., are separately estimated.
4. Requests for expenditure are coordinated with estimated income.
5. The departmental requests are prepared well in advance of the fiscal year, are reviewed in detail by the Mayor, submitted to the Council for their consideration and the final passage of an appropriation ordinance—all before the beginning of the fiscal period.
6. Requests for expenditure are classified by department, fund, character, activity, and object of purchase.
7. Transfers may be made, when necessary.

be financed. The actual preparation, consideration, and adoption of such a program, in accordance with accepted budget principles, are too seldom realized in our cities. Detroit's budget is an effective document, however, informative to the administrative departments, the legislative body, and the public.

The budget for the year ending June 30, 1922, is \$65,339,634, for the following characters of expense:

Fixed charges	\$ 7,229,326
Operation and maintenance.....	41,043,567
Public improvements	15,746,466
Deficits	1,320,275
Total	\$65,339,634

8. A contingent fund is provided for emergencies.
9. A system of appropriation accounting is maintained currently by the Controller, to assure that the budget plan as enacted is being observed.

C. E. RIGHTOR,
 Detroit Bureau of Governmental Research.

Police Departments

Traffic Vigilantes in St. Louis

St. Louis, Mo.—The experience that St. Louis has had with the work of a Traffic Vigilante Committee has been more than satisfactory—it has been distinctly profitable from the standpoint of safety. The slogan of the Vigilantes of St. Louis is, "Make St. Louis the Safest City in the World to Live In."

The organization consists of about 325 Vigilantes, and the only publicly known one of them is the Chief Vigilante, who is the writer. This secrecy about our organization has been maintained for several reasons, the best of which is that there is a marked psychological advantage in holding out to the general public, particularly the motoring public, the thought that there are a great number of keen-eyed, determined men watching to see that the law is not violated, and watching at the time when the uniformed policeman is not around. It is a patent fact that a man will not drive past a street car when it is unloading passengers if there is a uniformed policeman at hand, but the same man would try to sneak by if he did not fear that the motor car behind him had in it one of those argus-eyed Vigilantes. If that Vigilante carried some visible mark of identification on his car or person, he would be as conspicuous to the law violator as a policeman would. We feel that it is the secrecy

of the work that makes it most effective.

The plan of procedure is simple. If a Vigilante sees a traffic violation, he catches the license number of the offender. On one of the blank post-cards which he carries in his pocket he checks the particular offense committed (the post-card indicates about twenty), signs his Vigilante number, filling in the time and the place of the occurrence, and mails the card to the Chief of Police of St. Louis.

At the office of the Chief of Police, the Safety Council's Vigilante Division maintains a stenographer, a clever young lady who knows in most instances what to do. All these post-cards are turned over to her each morning and she sends out on each one a notice to the offender telling him what and where and when his offense was and instructing him to make a written explanation thereof to the Chief of Police. In case of a very flagrant or major offense, the offender is given peremptory orders to report in person to the Chief of Police to make explanation as to why he violated the law.

By this method we secure the good will of the Police Department because the report of our work is published each week in the *Police Journal*, which reaches every police officer, and it is felt that the Vigilantes are really auxiliary policemen who must be considered at all times and helped. The Board of Police Commissioners of the city is warmly and strongly in approval of our



A BRANCH POLICE STATION IN ST. LOUIS, MO.

work and renders every possible assistance, and the Chief of Police gives his heartiest support to us, and his hardest third degree to the offender who comes by invitation to see him.

The Vigilantes have been very active. There have been weeks when they have turned in as many as 2,000 reports of violations. That was when a special drive was on. The normal number of reports per week is 600. These cover practically every item of traffic law violations, including no lights and one light, but our best attention as Vigilantes is given to the major offenses, such as reckless driving, passing street cars when loading, passing corners at high speed, and others of a dangerous character.

The organization is very careful in the selection of members, for in the beginning a few mistakes were made. Appointments of very young men have not been satisfactory, because they used their badges to intimidate, to get out of trouble themselves, or to "play smart." The personnel now consists of men ranging from thirty to fifty years, all of them of excellent standing in the commu-

nity, many being heads of large businesses. The bigger the man is in the business world, the more anxious he is to help make his city the safest in the world to live in.

The total experience up to this time with the Vigilantes as an important branch of Safety Council work has been highly satisfactory and we would not recede from it nor drop it. In addition to keeping down the number of street accidents and casualties, it is of marked advantage to the local Safety Council itself in frequently furnishing opportunities for good newspaper publicity which do not arise from the more prosaic safety work done in industrial plants or schools.

ROBERT E. LEE,
Chief Vigilante.

ACKNOWLEDGMENT.—From an address delivered before the Public Safety Section of the National Safety Council at the Tenth Annual Congress.

Departments of Education

An Open Air Theater on the High School Grounds

SANTA MONICA, CALIF.
—Twelve years ago, when bonds were voted to build a new high school in Santa Monica, a few far-seeing persons planned that this should be erected on Prospect Hill, one of the most sightly locations for miles around, com-



TWO VIEWS OF THE OPEN AIR THEATER IN SANTA MONICA — THE UPPER LOOKING FROM THE STAGE, THE LOWER SHOWING THE STAGE. THE POOL ACTS AS A SOUNDING BOARD.



manding a magnificent view of ocean, plain and mountains.

They were criticised for building it off the beaten track, some distance from the principal residence section of the city, but they ignored criticism and went ahead. Today a splendid group of school buildings, a miniature college plant, ranking high in the United States for location, beauty of architecture, and equipment, crowns the hill which slopes gently toward the Pacific Ocean over an area of fourteen acres, all included in the High School grounds.

A part of the plan was the creation of an open air theater after the Greek style, but unique in following the architecture of the High School group. About two years ago bonds were voted by the people, and work was begun early last spring. This beautiful structure, which will seat 3,000 persons, has been completed at a cost of \$30,000. It has been dedicated as a memorial to the boys from Santa Monica who perished in the World War, and is now known as the Santa Monica Memorial Open Air Theater, a monument of which the city may well be proud.

The theater is terraced out of the hill at the foot of the High School grounds, provided with concrete benches, and an ample turf stage, on which has been planted a full-grown sycamore tree brought from a near-by canyon. A sounding-board, in the shape of an oval pool of water just in front of the stage, enables the voices of speakers to be distinctly heard by those in the highest tier of seats.

This theater is rather distinctive, if not unique, in high school planning, and a noble example of the progressive policy of a board of education. In its use, the theater serves both the school and the community at large.

HORACE M. REBOK,
Superintendent of Schools.

Fire Departments

It Pays to Advertise

BILLINGS, MONT.—Nowadays, when one has something that he wants to bring to the attention of "the man in the street," he advertises. The American public has been educated up to the idea of noticing advertisements, signs and bulletins. By the same



IF YOU LIVED IN BILLINGS, MONT., YOU
WOULD STOP A MOMENT TO
READ THIS BOARD

token, these notices must hold the attention, or they will get nothing more than a passing glance, and their message will soon be forgotten.

Business men advertise, showmen advertise, churches advertise—why not fire departments? More must be done than giving occasional talks to clubs and schools, holding formal fire drills, etc., if the nation-wide campaign for fire prevention is to continue to grow in effectiveness.

The idea of installing a bulletin board or display frame, like the one shown in the illustration, came to the undersigned as he was passing a motion-picture house. People of all walks of life pause to look at the poster of the movie hero or heroine. The experiment has shown that they will do the same before a striking display on the front of the fire station.

The display is changed periodically. To attract the first notice of passers-by, it usually contains one of two striking pictures of a fire. On coming closer, the citizen, his attention already aroused, reads the printed matter, which may be an account of the results of carelessness with fire, or the benefits derived from the use of some sort of fire-resisting building material, such as wired glass or metal sash. Statistics showing the annual or weekly fire loss are sometimes used, but sparingly, for it has been observed that the average reader "doesn't care for figures."

There is never any lack of material for display. All papers and periodicals coming to the Department are conned for articles. Pictures are often obtained from insurance interests. Such magazines as "Safeguarding America Against Fire" are clipped.

V. H. STEELE,
Chief of Fire Department.



ONE OF UTICA'S ATTRACTIVE PLAYGROUNDS

Recreation Departments

"Selling" Recreation to a Municipality

UTICA, N. Y.—For the year 1921 the Board of Estimate and Apportionment of the city of Utica granted an appropriation of \$20,000 for the Department of Recreation, a sum nearly double that which this department received the preceding year. In view of this appropriation, and also because the Department of Recreation as a separate department was not three years old, and consequently little known, the Recreation Commission realized the desirability of familiarizing the taxpayer with the activities of the department during the year.

In the attempt to make this appropriation go as far as possible in a city of 100,000, no provision was made for the publication of a report. In fact, owing to the prohibitive cost of printing, very few departmental reports were published by the city of Utica during 1921. The idea of printing a brief four-page folder largely of a statistical nature was borrowed from the Utica Council of Boy Scouts. The cost of printing these folders in quantity being less than \$7 a thousand, it was comparatively inexpensive to circulate them far more widely than a complete report could have been distributed.

In this folder, under the head of "Community Activities," it is stated that 49,635

people attended 162 community gatherings in 4 centers, which were largely self-supporting.

"Playground Activities" are referred to as "A laboratory for putting into practice the precepts of parent and teacher." Here we are informed that 189,499 attended 12 playgrounds during July and August, and, in addition, 46,251 attended grounds open during May and June after 4 P. M. Omitting

details, the main organized activities are enumerated: for example, 52 boys' baseball teams in 10 leagues, 13 girls' teams in 3 leagues, 39 volley-ball teams, 121 folk dances of 13 nationalities, 7 playgrounds with systems of self-government, 2,441 children in 61 story hours, etc.

Under "General Activities" it is stated that 29 organizations were aided in various ways in planning and carrying out field days, outings, social gatherings and diverse programs more or less recreational; 96 young men and young women were enrolled in a training course for recreational leadership conducted with the cooperation of various local agencies.

A brief statement of the aims, principles and methods of the Department of Recreation occupies the last page. In view of the appropriation previously mentioned, the following statement, appearing at the end of the tabulated statistics, is significant: "19 cents per capita was the total cost of maintaining the Utica Department of Recreation for the past year."

While the generous cooperation of all the local newspapers throughout the year and the space and endorsement given in the monthly bulletin of the Utica Chamber of Commerce are not to be underestimated, the Commission is convinced that the distribution of 10,000 copies of this folder has played a large part in "selling" recreation to the Utica taxpayer. Ample proof that Utica is "sold" on this proposition is seen in the increased appropriation just granted providing for 15 playgrounds and 8 community centers for the current year.

W. C. BATCHELOR,
Superintendent of Recreation.

Municipal Water Rates—Part II

A Thorough Analysis of Present Rates and Rate-Making

By E. E. Bankson, D. E. Davis and C. A. Finley*

GENERAL water service may first be separated into two groups, as public service and private service. It may be again divided according to flat rate service, and metered or measured service.

Flat Rate Service

The flat rate method of charging for water service is a heritage to us from pioneers in the water-works field, thereby carrying the approval of long custom, together with the approval of the wasteful user, because it winks at his extravagance at public expense. It seems to devolve wholly on the water-works men to gradually make obsolete the flat rate system. Flat rate charges or assessments are admittedly inequitable and conducive to wasteful habits, but being yet with us, they should always appear in excess of meter rate charges, for the same amount of service, with the hope that such a practice will create converts to the metered or measured service method.

The average domestic flat rate in the city of Pittsburgh is 55 per cent in excess of the meter rate for similar service, but every flat rate consumer has the option of transferring to measured service if he so desires. As against this high flat rate, there remain under flat rate service approximately two-thirds of the total number of consumers with no apparent desire to avail themselves of the economy offered; in fact, most of the metering accomplished has been of a compulsory nature.

The Pittsburgh plant has a capacity in excess of fully metered requirements, and it is interesting to discover through cost analysis that no economy can be effected by metering the entire city at once, or, at any rate, in excess of that necessity to reclaim plant capacity from wasteful service to useful service, or additional demands, as conditions may require. In the case of Erie, however, the plant capacity has been reached

under the present flat rate policy, and it is clearly evident, in the interests of economy, that a policy of metering domestic consumers should be adopted.

Metering may reduce domestic consumption more than half, which has the same effect as increasing plant capacity, and it is far cheaper to meter than to build additional plant. It would be poor economy—in fact, wasteful—to create additional plant capacity for the purpose of supplying flat rate consumers instead of placing them under measured service. Aside from discussion along lines similar to those above, we cannot see that flat rates have any place in scientific rate-making, for the reason that flat rates are subject to the laws neither of science nor of equity.

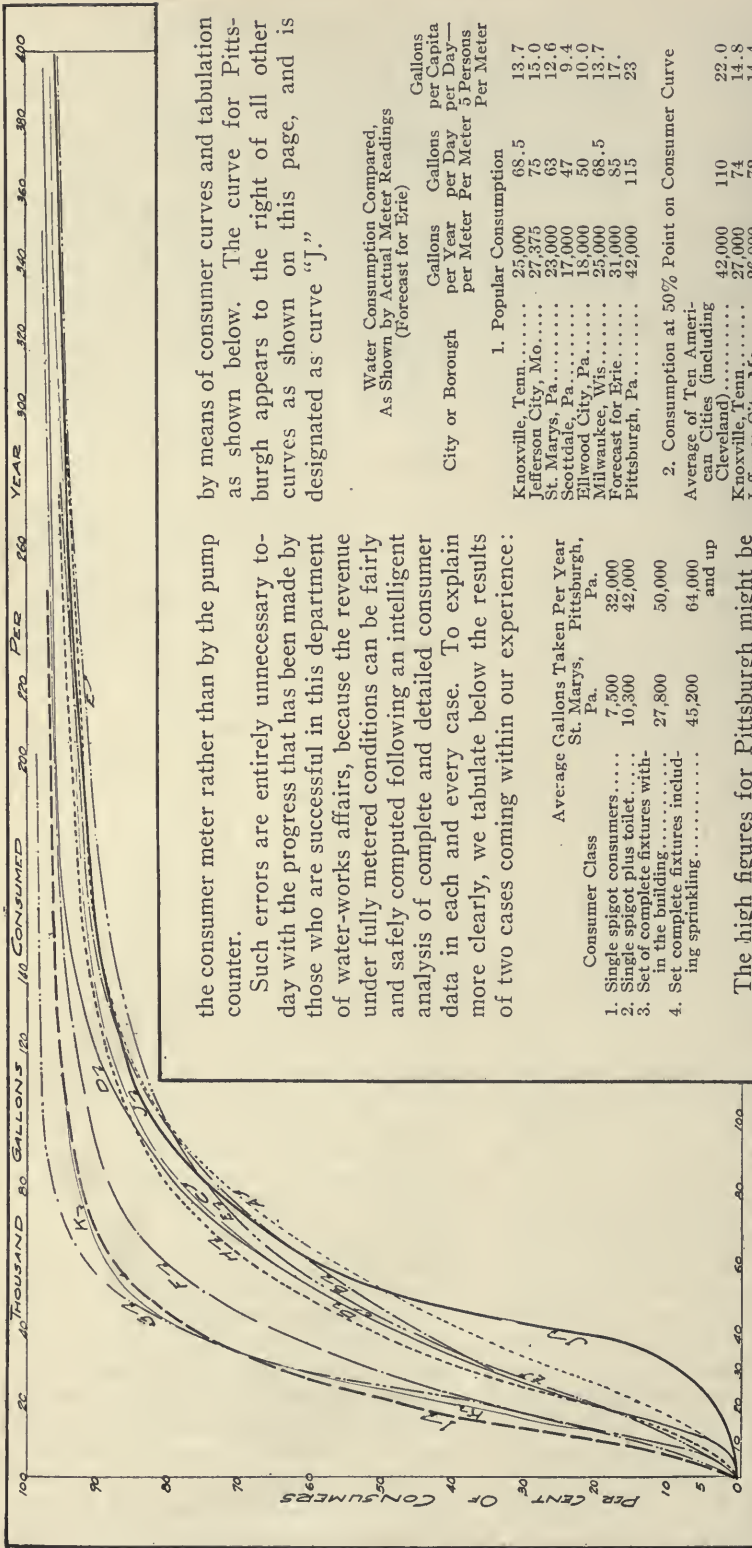
Measured Service

In the case of the city of Pittsburgh, the computed demand under fully metered conditions would show a reduction of 40 per cent from the present pumpage, which reduction represents no curtailment of useful service, but represents rather the reducible leakage and careless running of water to no avail.

There appears a common error among water-works men and engineers of over-estimating the amount of water which will be used when a city is fully metered, this error resulting in a financial deficit as metering progresses. This tendency to over-estimate is a logical result of a habit formed in designing plant capacity for maximum conditions, and such a designer carries this habit over into the field of rate-making, where he discovers, too late, that his measuring stick was too large and the revenue not realized as computed.

We have also observed a tendency, on the part of those inexperienced, to use present pumpage, of a flat rate system, as the starting point from which to forecast future revenue under fully measured service, apparently forgetting that there is no reliable relation between the two, and forgetting also that revenue is indicated by the dial on

* E. E. Bankson, of The J. N. Chester Engineers, Pittsburgh, Pa.; D. E. Davis, of The J. N. Chester Engineers, Pittsburgh, Pa.; C. A. Finley, Managing Engineer, Bureau of Water, City of Pittsburgh.



STUDY OF WATER CONSUMPTION BY METER MEASURE

Curves showing percentage of metered consumers taking less than indicated amounts of water

the consumer meter rather than by the pump counter.

Such errors are entirely unnecessary today with the progress that has been made by those who are successful in this department of water-works affairs, because the revenue under fully metered conditions can be fairly and safely computed following an intelligent analysis of complete and detailed consumer data in each and every case. To explain more clearly, we tabulate below the results of two cases coming within our experience:

Consumer Class	Average Gallons Taken Per Year	St. Marys, Pa.	Pittsburgh, Pa.
1. Single spigot consumers	7,500	32,000	
2. Single spigot plus toilet	10,300	42,000	
3. Set of complete fixtures within the building	27,800	50,000	
4. Set complete fixtures including sprinkling	45,200	64,000	and up

The high figures for Pittsburgh might be explained by the fact that so much smoke and dust demands more washing on the part of the public, coupled with the fact that the pressure at the spigot is rather high, being an average of 79 pounds and the maximum at different points in excess of 100 pounds. The divergence of the Pittsburgh results, in excess of the normal, is clearly shown

by means of consumer curves and tabulation as shown below. The curve for Pittsburgh appears to the right of all other curves as shown on this page, and is designated as curve "J."

Water Consumption Compared, As Shown by Actual Meter Readings (Forecast for Erie)

City or Borough	Gallons per Meter per Year	Gallons per Meter per Day	Gallons per Capita per Day
1. Popular Consumption			
Knoxville, Tenn.	25,000	68.5	13.7
Jefferson City, Mo.	27,375	75	15.0
St. Marys, Pa.	23,000	63	12.6
Scottsdale, Pa.	17,000	47	9.4
Ellwood City, Pa.	18,000	50	10.0
Milwaukee, Wis.	25,000	68.5	13.7
Forecast for Erie	31,000	85	17.
Pittsburgh, Pa.	42,000	115	23

2. Consumption at 50% Point on Consumer Curve

Average of Ten American Cities (including Cleveland)	42,000	110	22.0
Knoxville, Tenn.	27,000	74	14.8
Jefferson City, Mo.	26,000	73	14.4
St. Marys, Pa.	25,000	72	14.4
Scottsdale, Pa.	22,000	61	12.2
Ellwood City, Pa.	27,000	74	14.8
Madison, Wis.	36,000	99	19.8
Milwaukee, Wis.	42,000	110	22.0
Forecast for Erie	42,000	110	22.0
Pittsburgh, Pa.	52,500	144	28.8

The relation between fixtures and annual consumption was developed in the Pittsburgh case as shown by the following curve.

Distribution of the Burden

Meter rate schedules are generally one of three types:

1. Straight price to all per 1,000 gallons
2. Minimum charge type
3. Service charge type

2 and 3 are on the basis of either a straight price or a sliding scale, in addition to certain fixed charges. It is generally conceded as costing more per 1,000 gallons to serve a small consumer than to serve a large consumer, and if this fact be here admitted, we have thereby eliminated the straight-price or flat-price-to-all idea.

A minimum-charge type sliding-rate schedule can be constructed which would closely approach the costs of rendering the service, but the Public Service Commission of New York has ruled against the minimum-charge type in a gas case in the following words, which apply equally to water:

"The minimum gas rate is inequitable. A sample case cited is the best proof. Mr. A. and Mr. B. are in the minimum class, which is placed, say, at \$1. Mr. A. used 90 cents' worth of gas a month; he pays \$1. Mr. B. used 20 cents worth of gas a month; he also pays \$1. If the interest on the service investment to that residence or office is 50 cents, the company sustains a loss from Mr. A. of 40 cents that must be made up by some other consumer, while it has made a profit of 30 cents off Mr. B."

The service charge is recognized by the New York Commission in these words:

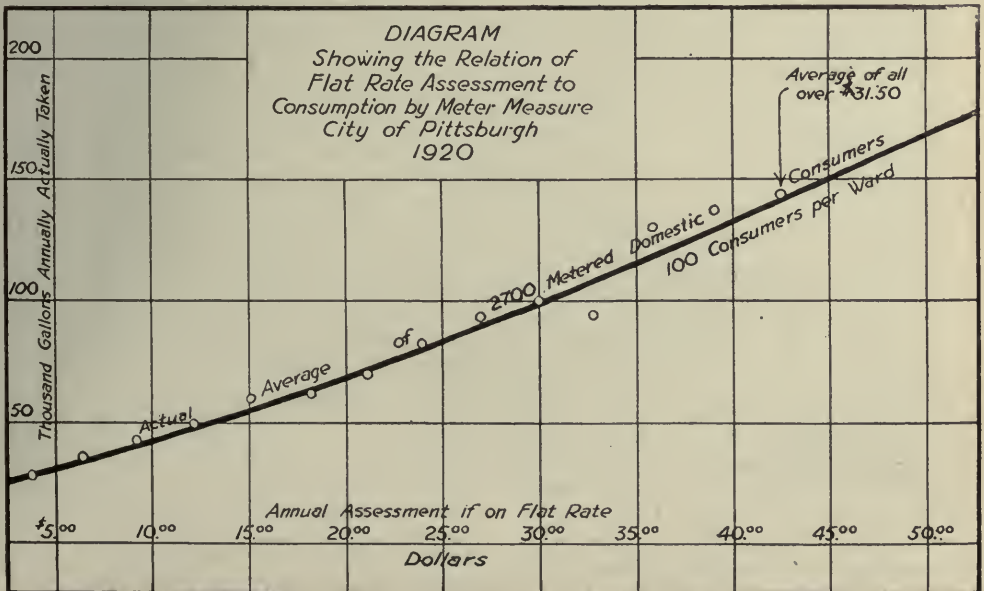
"A service charge . . . is a legal and just charge if properly adjusted as to amount." The Association of Boroughs in Pennsylvania, on advice of its counsel, has recently withdrawn a proposed bill intending to make the service charge illegal in Pennsylvania. These and many other incidents seem to indicate to the writers the increasing recognition of the service charge.

Service Charge Limitations

Advocates of the service charge have included portions of the total annual burden under this charge, ranging all the way from "single consumer charge" to "entire fixed charge and overhead expense."

The writers maintain that a proper service charge is usually in excess of a simple consumer charge, but much less than the total fixed charges and overhead expenses, and have developed principles on which the service charge can fairly be computed as indicated in two examples appearing at the end of this discussion.

The service charge is based on the assumption that a company stands ready, under certain expense, to do a service or sell a commodity for which no purchaser may materialize. In so far as it is compelled to do so or is reasonably in danger of having to do so, the company is undoubtedly entitled to financial remuneration and to have its financial position insured.



It is not any fixed condition that may be applied empirically to all plants, but exists between two limitations which may be designated as the maximum service charge, when the plant stands ready to deliver and no water is taken, and the minimum service charge, when the size, diversity and variety of consumers maintain practically a constant demand on the plant.

It is assumed that in order to warrant any service charge, it must be shown that the conditions on which it is based actually exist; it must be a real condition and not based on any theory of what might or could happen. It must be based on common sense and actual facts developed from the operating conditions of the plant in question.

The full or maximum service charge may be said to exist when a plant is fully established with reservoirs full and pipe lines under pressure running at a rate just sufficient to offset leakage losses but with no one taking water. The minimum service charge exists in the case of a plant whose customers maintain a constant cycle of demands on the plant and where there is no loss due to standing ready to serve.

A typical example of the maximum service charge would be when a plant has one customer taking the entire output, but taking it at such irregular times and in such uncertain quantities that the plant is compelled to keep its entire equipment ready for operation at a moment's notice. The cost to this plant, even when no water whatever was taken, might easily be 90 per cent or more of its full operating cost. The plant is rendering what may be typically designated as a service as distinguished from the sale of a commodity, and it is entitled to remuneration therefor. The service in this case financially predominates over the sale of the commodity.

A typical example of a minimum service charge may exist with a large city plant having, say, 100,000 customers whose varied demands on the plant impose on it practically a fixed cycle of conditions hourly, daily, weekly and seasonally. Such a plant is usually so designed that it is practically at no actual expense on account of standing ready to serve a commodity for which there is no purchaser. Its function is the sale of a commodity as distinguished from mere readiness to sell. Practically speaking, the maximum loss directly imposed by failure of

a purchaser is the loss incident to the service line, the meter and the reading and billing; these, having been determined, can be designated as a minimum service charge.

The maximum service charge may be considered in its application to a certain large city plant which serves about 100,000 customers at an average rate of about 15 cents per thousand gallons. If the theory of the service charge be carried to its logical sequence and it is assumed that all customers withdraw their patronage, the expense of this plant would still be over 90 per cent of its active operating expense. If this 90 per cent were provided for in a service charge, the price of the water would be about 1½ cents per thousand gallons, with the result that the plant would be on a flat rate basis and meters would be of no practical value. As a matter of fact, this plant (aside from fire protection) is not primarily in the business of furnishing a service, but of selling a commodity, and suffers practically no financial risk or possible embarrassment from standing ready to serve. It does lose the interest and maintenance on the meter in addition to the billing charges, when the customer fails to buy, and is entitled to collect this in the event of the customer's failure.

The two extremes in the type of plant have been taken to show the wide possible range of a service charge designed to meet the financial risk imposed on a plant in standing ready to serve. In one extreme, the service cost takes precedence over the commodity charge and amounts to practically the whole bill; in the other instance, the commodity charge takes precedence and nearly absorbs the service charge. The range of possibilities between these two extremes is infinite.

In the case of the Consolidated Ice Company vs. the city of Pittsburgh, it was necessary, in the interests of the city, to combat a theory which developed a high service charge and a low commodity charge, and we quote from the testimony of Mr. Finley in that case as follows:

"To maintain this condition in the Pittsburgh plant, even if no water were sold, means the pumping of about fifteen billion per year to keep the plant full. The cost of supplying these fifteen billion gallons, instead of the forty-five billions now handled, would be a large percentage of the present cost, substantially the entire cost, except as follows: the saving due to not pumping the thirty billion gallons which the

consumers now use would be about \$350,000 (out of a total annual burden of about \$2,650,000), and the ready to serve charge would be the total cost of production less this \$350,000. If now the suggested method of allocating this charge according to the suggested basis in fixed quantities against the consumers is adopted and the \$350,000 is allocated amongst the consumers according to the amount of water used, then, to all practical intents and purposes, the city is back again on a flat rate assessment basis, except for the fact that the consumer, in addition to the fixed amount laid up against him, would pay something over one cent a thousand gallons for the water consumed. This means that the entire economic value of metering would disappear. There would be no check on the waste of water, no personal interest on the consumer's part to eliminate waste, and the unnecessary outlay of capital in order to handle this waste would then obtain. . . . If the art of supplying water to large communities is to make any economic progress, and there is no question as to the desirability of this end, it must not be defeated by any false rate hypothesis which takes

but little account of the amount of water used and virtually harks back to the flat rate theory based on what might, or could, or should be demanded of the plant. The water meter is the instrument by which great advance in the economy of the art is to be effected. It introduces the element of self-interest in the relation of the consumer to the producer and produces a result which no amount of inspection, argument or propaganda can accomplish. It shows on its dial just what has happened to the plant regardless of the value of any orifice and what it might or might not have demanded. It reveals the big consumer and the little consumer in their true relations, and it is not surprising that many rate schemes have been developed, the purpose of which has been to defeat the objects of metering and to escape the responsibility of paying in accordance with the meter readings. Any such rate scheme which submerges the retarding influence of the meter on waste water, smothers the greatest opportunity for economic advancement available at the present day in the art of supplying water."

(To be continued in the May issue)



Courtesy Electric Merchandising

WELL-LIGHTED SUBURBAN HIGHWAY BETWEEN SCHENECTADY AND ALBANY, N. Y.
 Proper lighting units placed at correct heights and intervals can make night travel almost as easy, safe and fast as day travel

An International Clearing-House of Civic Information

THE International Union of Cities—l'Union Internationale des Villes—was first organized in Ghent in 1913. It was interrupted by the war, but renewed with enthusiasm in Brussels in 1920. At the reorganization meetings Stephen Child, city planner, of Boston, was present and was delegated to further the interests of this Union in America. In connection with this work he spent some months during the summer of 1921 at the Brussels headquarters. He states that the main purpose of the Union is to collect and study contemporary documentary information of all kinds relating to civic affairs, and to distribute briefs or short reviews of such material throughout the world. The details of the organization are varied to suit the peculiar conditions of the nations interested. In Europe, for example, National Unions of Cities are formed, the cities themselves joining officially and paying fees dependent upon population.

For America, however, it is now proposed, after much study of our conditions and many conferences with leaders in civic affairs, to organize in Washington, in the Division of Construction and Housing of the Department of Commerce, a Bureau or Center to be affiliated with the International Center at Brussels. This American Center would then, in cooperation with the Library of Congress (which would act as Custodian of Documentation and rearrange its own rich stores of civic data to fit this need), collect and digest contemporary American civic data, contributing this to the international organization, would contribute thereto also a small sum annually as America's share toward the support of the Central Office, and would receive therefrom the invaluable current civic data from European and other civilized lands. Our National Center then would distribute freely to our progressive communities and civic organizations all these important data in regard to world-wide civic conditions, which they so greatly need and for which some of them now pay large sums of money

through the expense of investigating committees.

These data are disseminated from Brussels by means of a series of pamphlets containing brief reviews of municipal documents. The notes or summaries are printed on one side of the page only, permitting members to cut them out and mount them on cards, assembling and classifying the items as they arrive month by month. To facilitate this process, each separate item is numbered in accordance with the Dewey system of decimal classification.

The note-books thus made serve as the necessary intermediary between the central collections and the administrative organizations, for whose use all the various collections are destined. By their means, all who are interested receive, in abridged and condensed form, the broad and intense movement of municipal activities revealed by the literature of civilized countries.

The work of organizing subsidiary centers is proceeding rapidly in France, Belgium, Italy, Holland, the United States, England, Germany, Spain, Portugal, Poland, Scandinavia, and many other countries. Eventually there will be established a world-wide organization through which it will be possible for all classes of its membership to receive not only the reviews of all contemporaneous municipal development, but also answers in considerable detail to particular questions. The organization of this service will take more time; it will, in fact, require additional funds and will therefore be available to members only on payment of nominal fees covering its cost. By this means, however, an affiliated member or organization—a city planning commission in America, for example—desiring to know more about a certain subject than is given in the brief reviews of the pamphlets, can receive all the details—facts, figures, and even photostat copies, plans, drawings and pictures, if desired. In this way the International Union of Cities will become in very truth an international clearing-house of civic information.

Municipal Finance

BONDING

ACCOUNTING

TAXATION

Is Your City Living Within Its Income?

ACCORDING to the latest available figures from the Bureau of the Census, three-fourths of the cities of the United States are living beyond their incomes. Figures are now available for 156 cities. Those for 71 were given in the December number of *THE AMERICAN CITY*, and those for 85 of the remainder are given herewith.

The dates covered are, roughly, the twelve months prior to June 30, 1921. For cities whose fiscal years do not end on that day, the figures given are for the last complete fiscal year prior to that date. The same exception holds for the three columns headed 1920-1917-1914. In some cases this should be read 1921-1918-1915, according to whether or not the greater part of the fiscal year in question lies in one or the other calendar year. The grouping is the most satisfactory that can be made for purposes of comparison without uselessly complicating the tables.

The tables headed "Costs" represent the entire expenses of the city for the year, and the same applies to the receipts. The columns headed "Surplus" and "Deficit" represent the difference between the expenses and the total revenues. The figures for debts include both the funded and the floating debts, minus the sinking fund assets, if any.

What May We Conclude?

When the former table was published in *THE AMERICAN CITY*, it seemed unwise to suggest many conclusions, as only 71 cities were represented. But with the figures for 156 cities at hand, it is possible to draw certain very definite conclusions, without resting the case upon the statistics for any one city, which, as was explained in the December issue, may be temporarily affected by extraordinary local conditions.

The first conclusion is that it would be

highly desirable if the cities of the United States, possibly by state groups, would adopt uniform systems of classification of receipts and expenditures and accounting. There is at present the greatest diversity of classification, nomenclature, and method. While this does not appear in the consolidated tables given below, it is one of the outstanding features of the facts from which these tables were compiled.

The second conclusion is that American cities are badly in need of better budgeting. It is important that three out of every four cities are spending more than they are receiving; but it is not less interesting that some—a few—cities tax more heavily than they need to for their anticipated expenditures. The figures seem to indicate that in a great many cities—a large proportion, in fact—the so-called budget estimates either of revenue or expense are little more than guesses. It is, of course, impossible to predict exactly what the expenses or revenues of a coming year will be; but it is not impossible to have the two figures come within hailing distance of each other. Sometimes, however, totally unforeseen circumstances will arise which will disarrange even the most accurately prepared budget, and bring about, for instance, a very wide discrepancy between anticipated and actual expenditures. For that reason this conclusion, which is correct in general, should not be applied severely against any particular city without complete knowledge and thorough investigation of local circumstances.

The third conclusion is drawn from a comparison of the per capita funded and floating indebtedness of the cities. A city cannot offer its citizens the full advantages which they deserve, in the way of pavements, school buildings, parks and playgrounds, etc., without incurring large debts. These will be funded debts, and are quite

distinct from floating debts, which are often incurred without sound basis. Too often the floating debt is merely a device to cover imprudent spending to please the voters, without raising the taxes and so antagonizing the taxpayer. But the funded debt usually represents solid benefits to the community; and it is interesting to note that some cities carry a very light funded debt. Such cities may properly ask themselves if they are not being too thrifty—if they are not denying themselves certain advantages which would be worth far more than their cost, in public health, convenience and general welfare. It is no particular credit to a city to have an abnormally low funded debt if that means that the school children are badly housed, or that the city's streets are

mud half the time and swirling dust the remainder.

The fourth conclusion is that it is difficult to establish a "fair" or average tax rate, or per capita cost of government. The cost of administering Mobile, Ala., was \$19.25 per capita for the year, while the city government of Seattle cost every inhabitant over five times as much. The other cities range in between.

The reader, looking over the table, can draw other conclusions based upon his particular knowledge of cities and their local conditions. But not one can give these tables even the most superficial study without realizing the importance of such statistics and the practical benefit that will attend their careful consideration.

State and City	Per Capita			Deficit	Per Capita Debt Minus Sinking Fund Assets			Form of Government
	Cost	Receipts	Surplus		1920	1917	1914	
ALABAMA								
Mobile	19.25	18.75	....	.50	50.45	49.17	55.86	
CALIFORNIA								
Los Angeles	69.20	73.52	4.32	....	75.03	92.45	96.12	Council
Oakland	38.74	39.69	.96	....	40.66	43.56	54.48	
Pasadena	73.57	67.69	....	5.88	52.58	59.20	73.22	City Mgr.
San Francisco	53.04	51.99	....	1.05	96.75	83.65	92.60	
San José	21.77	22.74	.98	....	43.21	30.73	31.56	City Mgr.
CONNECTICUT								
Bridgeport	52.54	46.24	....	6.30	75.08	58.61	21.64	
GEORGIA								
Atlanta	31.71	31.49	....	.22	17.58	22.48	28.09	
Augusta	40.97	44.84	3.87	....	62.57	71.04	66.81	
Columbus	33.14	28.46	....	4.67	33.30	....	....
Macon	31.74	29.21	....	2.53	37.41	33.15	29.56	
ILLINOIS								
Chicago	47.99	40.89	....	7.10	32.31	28.30	27.34	Council
Cicero	27.14	23.88	....	3.26	13.72	....	....	Pres. & Trustees
E. St. Louis	24.97	27.79	2.82	....	29.86	26.01	21.57	Commission
Evanston	42.13	36.19	....	5.94	15.19	....	....	Council
Oak Park	35.46	35.64	.17	....	34.64	....	....	Pres. & Trustees
Quincy	37.46	35.79	....	1.67	6.44	8.20	9.83	
INDIANA								
Gary	48.11	42.51	....	5.60	16.02	15.38	....
Indianapolis	38.58	33.40	....	5.18	46.82	23.43	18.19	Council
IOWA								
Cedar Rapids	48.32	39.25	....	9.07	36.35	23.79	34.18	
Council Bluffs	45.52	34.88	....	10.64	42.45	29.07	29.47	Council
Des Moines	52.97	44.03	....	8.94	56.36	45.99	32.02	Commission
Dubuque	34.31	32.15	....	2.16	21.47	21.18	26.56	
KANSAS								
Wichita	50.62	32.01	....	18.62	40.58	26.07	36.52	Commission
MASSACHUSETTS								
Boston	65.48	71.38	5.91	....	107.29	117.66	116.47	Council
Cambridge	46.33	50.60	4.28	....	51.80	58.53	67.23	
Chicopee	48.50	39.98	....	8.52	37.83	....	....
Fitchburg	45.42	41.26	....	4.16	49.41	46.12	42.46	
Haverhill	36.10	35.74	....	.37	22.81	28.85	35.39	
Lawrence	36.31	40.95	4.64	....	34.04	49.04	28.21	
Holyoke	61.41	57.40	....	4.01	48.55	49.90	54.57	
Lowell	43.11	35.01	....	8.10	37.10	29.14	24.52	
Malden	33.97	35.22	1.25	....	26.99	28.06	26.99	
New Bedford	51.59	45.84	....	5.75	72.90	75.07	74.98	
Newton	72.91	69.43	....	3.48	50.60	51.42	64.03	
Springfield	54.00	47.00	....	6.20	69.26	64.77	71.12	
Waltham	43.29	38.65	....	4.64	22.78	14.41	....
MICHIGAN								
Battle Creek	49.88	46.45	....	3.43	22.62	8.36	....
Grand Rapids	41.57	39.67	....	1.90	31.20	31.23	30.74	
Pontiac	64.19	35.98	....	28.21	74.51	....	....
MISSOURI								
St. Louis	40.57	39.55	....	1.02	19.42	23.21	30.17	Council
NEW JERSEY								
Atlantic City	69.13	65.53	....	3.59	151.16	150.32	142.86	
Bayonne	65.32	46.54	....	18.78	90.03	28.79	40.03	Commission
Camden	34.12	28.60	....	5.52	43.92	43.69	42.11	

State and City	Per Capita			Deficit	Per Capita Debt Minus Sinking Fund Assets			Form of Government
	Cost	Receipts	Surplus		1920	1917	1914	
Elizabeth	33.33	27.77	.....	5.66	24.49	28.96	38.18	
Hoboken	79.22	39.94	.....	39.28	59.63	59.72	44.21	Commission
Passaic	29.77	25.16	.....	4.61	50.61	38.05	38.12	Commission
Perth Amboy	57.98	36.53	.....	21.45	41.46	53.02	38.83	Council
Trenton	33.25	38.69	5.44	.....	47.57	27.10	25.38	
W. Hoboken	22.52	23.37	.85	.....	23.45	25.32	26.33	Council
NEW YORK								
Auburn	40.04	37.79	.....	2.25	18.37	19.33	16.31	
Buffalo	57.13	55.28	.....	1.85	70.58	71.23	70.58	
New York	59.53	53.49	.....	6.04	182.93	186.11	179.44	
NORTH CAROLINA								
Wilmington	32.86	25.56	.....	7.30	75.45	60.55	.....
Winston-Salem	39.46	27.05	.....	12.41	58.25	51.29	.....
OHIO								
Canton	43.40	26.43	.....	16.97	98.05	60.23	41.90	
Cincinnati	53.48	48.15	.....	5.34	190.06	167.76	152.41	Council
Columbus	55.38	38.70	.....	16.68	59.93	44.04	48.68	Council
Portsmouth	22.96	24.12	1.16	.....	73.47	.....	.....	Council
Springfield	27.36	28.16	.80	.....	41.77	42.71	40.69	
Youngstown	40.93	26.25	.....	14.68	60.95	47.45	37.29	
OKLAHOMA								
Oklahoma	48.98	33.55	.....	13.44	73.23	65.82	62.37	Commission
Muskogee	40.23	43.26	3.03	.....	100.32	76.34	84.65	City Mgr.
PENNSYLVANIA								
Chester	21.56	17.29	.....	4.27	33.80	23.99	27.28	Commission
Harrisburg	30.20	29.74	.....	.46	42.92	35.26	39.45	Commission
Lancaster	16.77	17.93	1.16	.....	27.17	30.52	25.68	Council
Pittsburgh	63.01	54.28	.....	8.75	107.91	95.08	93.13	
Scranton	23.18	21.85	.....	1.33	18.49	21.93	19.03	Council
TENNESSEE								
Memphis	33.89	35.26	1.37	.....	87.90	90.79	88.01	Commission
Nashville	29.08	26.36	.....	2.72	74.63	63.12	53.10	Commission
TEXAS								
Beaumont	32.11	29.51	.....	2.61	47.62	.....	.....
Dallas	49.02	35.95	.....	13.07	62.80	43.51	53.26	
Galveston	33.85	35.51	.....	1.67	105.08	123.74	125.45	
UTAH								
Ogden	48.96	35.29	.....	13.67	50.88	38.70	.....
VIRGINIA								
Newport News	31.03	19.19	.....	11.85	39.87	.....	.....
Norfolk	62.22	36.31	.....	25.91	105.31	87.91	84.45	
Portsmouth	29.01	21.92	.....	7.69	94.35	47.13	44.99	
Richmond	35.56	39.91	4.35	.....	83.33	76.09	80.29	
WASHINGTON								
Seattle	107.72	91.39	.....	16.35	180.12	118.54	114.24	Council
WEST VIRGINIA								
Charleston	34.33	30.55	.....	3.77	42.24	32.06	.....
Huntington	26.76	27.70	1.03	.....	34.99	34.45	34.33	
Wheeling	41.19	27.39	.....	13.79	23.46	19.20	22.93	
WISCONSIN								
Racine	45.97	37.94	.....	8.03	26.95	18.29	19.87	Council
DISTRICT OF COLUMBIA								
Washington	51.63	55.42	3.79	.....	2.60	9.40	16.26	

The Growing Demand for Noiseless City Streets

That there is a growing demand for less noise in city streets is shown in the clamor among citizens and officials in New York and other eastern cities for a type of pavement that will reduce the noise of heavy motor traffic. Clifford Pinckney, City Engineer of Manhattan, recently adopted the resilient asphaltic concrete base for Fifth Avenue with this end in view, claiming that this type of construction takes up the shock of impact. The Public School Principals' Association of Newark, N. J., has asked the City Commission in that city to adopt a paving construction program to extend over four years that will provide noiseless pavements in the vicinity of the schools. In voicing this attitude, Newark takes the lead in this respect among the cities of the coun-

try. The complaint in Newark is that the constant noise caused by heavy vehicles running over rough or rigid pavements prevents both teachers and pupils from carrying on their work effectively. It is the benefit of the principals that the greater efficiency permitted by pavements that are smooth, resilient and noiseless will more than compensate for the additional cost.

The action in Newark is in line with conclusions long since reached by hospital authorities everywhere and by the owners of theaters and auditoriums in many places. Professor Stevenson of Rutgers College, in a recent address before the Philadelphia Engineering Society, emphasized the importance of noiseless street pavements.

An Attractive School Entrance



Courtesy Architectural Record

ENTRANCE STEPS OF HIGH SCHOOL AT PORT CHESTER, NEW YORK
Hewitt and Bottomley, Architects

Clearing Roots From Sewers

Fifteen Thousand Feet of Sewer in Schenectady, N. Y., Freed From Obstructions

IN the last year the Department of Public Works of Schenectady, N. Y., has removed root growths from more than 15,000 feet of sewers under the direction of Charles Hayes, Superintendent of Sewers. Only the sections of the city where conditions were the worst were selected for the first operations. The cost of the cleaning

eters. The cleaner is placed in the sewer main at one manhole and drawn to the next one by means of a steel cable attached to a hand-operated windlass. Jointed rods are forced through the sewer first, and it is to these rods that the cable is attached while it is drawn through. In some cases the department has found sewers so badly clogged



THIS ARRAY OF ROOTS FROM 100 FEET OF SANITARY SEWER ON LINDEN STREET, SCHENECTADY, QUITE EFFECTIVELY HELD UP THE FLOW OF SEWAGE

operations was \$1,300 for labor, and the interest and depreciation on the Turbine sewer cleaner and other equipment amounted to approximately \$1,050.

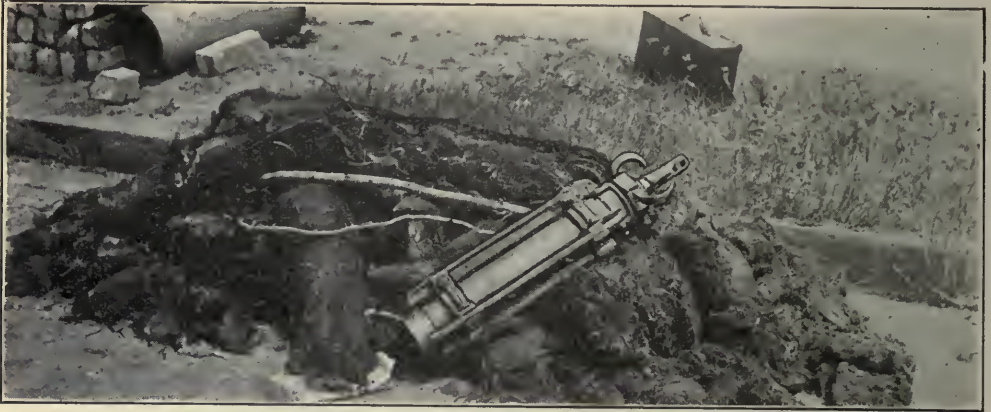
If an attempt had been made to excavate, clean and replace the sewers which had been blocked by root growths, the cost would surely have exceeded \$10,000. The work of cleaning the sewer was delayed for some time at the beginning in order to build several new manholes, as the cleaner could not be used in sections where the manholes were more than 450 feet apart.

The machine used consists of a water motor equipped with guides and cutters to adapt it for use in sewers of varying diam-

eters that it was very difficult to force the rods through the entangled growth.

The cutter of the machine is revolved by the water motor, which is run by water pressure supplied through lengths of fire hose attached to the nearest hydrant. The water discharged from the motor flushes out the roots and discharges them at the next manhole below, where they are caught and removed to the street.

In Schenectady there are about 150 miles of sewer mains with pipe joints every two or three feet, through which it is possible for tree roots to gain entrance. Several years ago an ordinance was passed requiring the removal of all poplar trees within a



THE MACHINE THAT REMOVED THIS PILE OF ROOTS AND DIRT FROM 151 FEET OF 8-INCH SEWER IN SCHENECTADY

specified time. The sewer department, however, found that the roots of soft maples and elm trees were causing almost as much trouble in the sewers as the poplar roots,

and they are much more difficult to remove. In a few cases the roots were found to be so thick that it was necessary to remove sections of the sewer pipe to get them out.

Building Up a Municipal Light and Power Plant

The Interesting Growth of the Municipal Plants at Greenville, Texas

By H. L. McLow

Commissioner No. 1, Greenville Municipal Plants, Greenville, Texas

THE original municipal light and power plant at Greenville, Texas, was installed in 1890 and consisted of one belt-driven, 200-kilowatt generator. A bond issue of \$15,000 was issued and applied to the construction of this plant, which was located in the down-town section. In 1909, under the leadership of Mayor Nichols, a bond issue of \$50,000 was authorized and two new Allis-Chalmers units were installed at the present location in connection with the Greenville water-works, and the present light and power system was established. The writer has been in charge of the development and administration of the combined plants since 1913.

Over \$100,000 has been expended in securing new equipment and in expansion since 1916. Every cent of this has come out of the revenue of the plant, and no bond issues have been sought. The total amount of bonds issued since the plant was instituted,

including all outstanding indebtedness incurred by the city of Greenville on account of its electric light and power plant, is \$65,000, of which there remains outstanding only about \$41,000 in less than 5 per cent bonds. The commercial value of the electric light and power system of Greenville is estimated at \$500,000. Space is already allotted for a 1,000-kilowatt steam turbine, which will be the next unit to be added.

The street and commercial lighting services are on independent circuits, and a third independent circuit is being installed for power service.

Notwithstanding the high cost of coal, material, labor and operation in general since 1916, there has been no increase in the light and power rates to consumers, and the plant has been successfully operated for the past eight years at the rates given below. The income from these rates has taken care of all charges, including the retiring of



INTERIOR OF POWER-PLANT OF THE GREENVILLE, TEXAS, LIGHT AND WATER WORKS

bonds, and, as reasonable proof that the plant has been adequately maintained, it has been out of commission only 25 minutes during that period.

LIGHTS

First 100 kw. at 10 cents
 Next 200 kw. at 9½ cents
 Next 200 kw. at 9 cents
 Next 500 kw. at 8½ cents
 Excess 1,000 kw. at 7½ cents
 Minimum charge 50 cents per month

POWER

First 500 kw. at 4 cents
 Next 500 kw. at 3½ cents
 Excess 1,000 kw. at 3 cents
 Minimum charge 75 cents first horse-power or fraction
 50 cents each additional horse-power or fraction
 3 cents kw. for stoves, without minimum charge

This plant supplies all of the electric light and power in the city of Greenville and in the territory five miles beyond the city limits. It maintains itself without any tax on the people and operates 2,100 street lights, 295 white way lights, gives light and power to the public schools, municipal buildings, parks and playgrounds, and takes care of all maintenance and operation charges and all expansion and improvement, interest and sinking fund for the bonds originally issued for its installation. In 1913 the plant capacity was 1,000 kilowatts per day, and in 1921, 6,950 kilowatts a day is obtained regularly from the 5,000-kilowatt turbine alone.

Paving Assessments in St. Paul, Minn.

In St. Paul, Minn., the cost of not exceeding 12 feet of paving can be assessed against abutting property. This is based on the theory that all city streets should have paved roadways for comfort, convenience and sanitation, and that the property abutting on the pavement should pay for such a part as may be required to give access to that property and provide a passageway for vehicles going to neighbors' property.

With a 24-foot pavement and a vehicle standing at the curb on opposite sides, there will be room for a vehicle to pass between. If any greater width of paving than 24 feet is necessary, it is for the purpose of a street car line, motor bus traffic or through traffic.

Abutting property is not assessed for paving the street railway portion of the street, and there is no reason why it should be assessed for paving the right of way for trucks, motor busses or pleasure cars bound for some distant part of the city. While not more than 12 feet can be assessed against the abutting property, the city council can to its discretion assess the cost of less than 12 feet. This enables it to pave outlying street connections with county highways or state roads where the property could not stand the entire assessment for the pavement. The cost of the paving that is not assessed is met through a wheelage tax, general revenue or a bond issue.

Rat Extermination and Its Part in Public Health Campaigns

By **Edmund B. Besselievre**
Consulting Engineer, New York

THE rat has been convicted of being one of the most serious offenders in the spread of disease and the destruction of property. On the evidence presented by sanitarians and public health officials, the systematic extermination of the rodent is now recognized as an integral part of all comprehensive health campaigns.

In the Southwest, and especially in the states along the Gulf Coast, the rat has become abhorrent as the primary agent in the spread of bubonic plague, epidemics of which have caused great loss of human life and property in several cities in that region. The cities and states that have been afflicted with that terrible visitation are strenuous advocates of rat extermination, and it would be wise for other municipalities and states to follow these examples and include exterminative measures in their general health programs.

It has been stated on excellent authority that the rodent population of the United States is equal to the human. In that case, the problem of rat extermination would be easily solved if each of us would take upon himself the task of killing one representative of the genus "Mus." We could aptly adopt as the slogan for such a campaign

"Get Your Rat."

The individual effort, however, should not cease with the getting of the one rat. In view of the inefficiency of many of us, each of us should "get" as many rats as possible.

Exterminative measures are of different kinds. It is seldom sufficient to employ one only. Usually a combination of several methods is adopted and proves to give the quickest and most effective relief.

Methods of extermination may be divided into three general classes:

1. Natural
2. Mechanical
3. Chemical

These three classes cover the general basic agencies now in use among sanitary engineers and public health officials, and

each one of them includes several types or subdivisions, each particularly applicable to some combination of local conditions.

A brief article does not permit explaining in detail the means of applying each method, but a casual discussion of them from the view-point of expediency and efficiency will serve a useful purpose:

1. Natural agencies
 - a. Starvation
By removal of sources of food supply and by proper protection of foodstuffs and other rodent comestibles
 - b. Suffocation
By effectual closure of exits from burrows or harborages
 - c. Natural enemies
Use of cats, dogs, ferrets and other natural enemies
 - d. Destruction or removal of harborages and breeding-places
2. Mechanical agencies
 - a. Trapping
By cage or snap traps set and baited by volunteer or paid trappers
 - b. Destruction of breeding-places
By tearing down, boarding up, fire, etc.
 - c. Ratproofing
By proper ratproofing of dwellings and business establishments, particularly places where foods are stored
 - d. Shooting
By regular roundsmen or organizations of Boy Scouts and others
 - e. Drowning
By flooding burrows and holes with water, with the possible assistance of the fire department, etc.
3. Chemical agencies
 - a. Poisoning
By means of standard brands of manufactured rat foods and poisons
 - b. Suffocation
Through the use of noxious gases and fumes in burrows and inaccessible places where rats are known to harbor

Each of these methods has its peculiar degree of fitness in certain cases. Some of



SCENES FROM THE SOUTHWEST WHERE ANTI-RAT CAMPAIGNS HAVE BEEN PUSHED EFFECTIVELY

Upper Left—A city dump where plague-infected rats were found. Upper Right—Shrubbery near this residence must be trimmed out and the building raised to an elevation of 18 inches from the ground or a 'chain wall' placed under the building. Below—Proper foundation for a bungalow to insure protection from rats

them are more generally adaptable in public campaigns than in cases of single dwellings or foci.

In the several campaigns for the eradication of bubonic plague with which the writer has been connected, the combination of methods that procured the maximum degree of extermination in the shortest space of time were starvation, destruction of breeding-places, trapping and ratproofing, and in cases where shipping was involved, the employment of chemical suffocation.

While the destruction by natural enemies would seem to be one of the easiest and cheapest plans to adopt, it is not encouraged by experienced officials, especially in those localities where rat-borne diseases are present. It is true that the cat and the ferret and the smaller members of the canine family can reach the rat in places where ordinary human agencies would fail, but should the rat be infected with bubonic plague or some other disease, the fleas with which he is infested will upon his death emigrate to the fur of the animal which has killed him. In the case of the cat or the dog, which is usually allowed in the house, the disease-bearing flea is then carried directly into contact with humans.

Shooting is seldom employed on a large scale, as it requires a fairly expert marksman to shoot and kill a rat in the short time in which Mr. Rat allows himself to be seen in human presence. Usually the result is a wounded rat, which will crawl into the nearest hole or burrow, there to die and remain as a noisome reminder of an ineffectual method. Drowning is not wholly satisfactory, because it is difficult to discover the proper hole in which to apply the water. Rat burrows usually have several exits, and if any one of them is left open, the water has no effect.

Poisons are often efficacious in individual houses or in places where doctored meat or food can be placed in the rat's path of travel, but the use of this method is discouraged in a general campaign. The chunks of poisoned meat or other food are just as attractive to a hungry cat or dog as to a rat, and if promiscuously distributed, may cause angry pet-owners to make their presence felt around campaign headquarters.

Noxious gases have been tried, but, outside of their general use on board ships, have proved to be of no great service. They are dangerous to human life unless expertly handled, and it is very difficult to close all

the cracks or vents in an ordinary building to make the gas effective. On shipboard, where all ports are provided with tight closures, the use of hydrocyanic acid gas has been adopted as the standard means of fumigation and has given very encouraging results. Even there, however, careless handling and improper airing of the hold of a vessel have several times caused the loss of human life. Hydrocyanic acid gas is odorless and colorless and takes immediate and deadly effect.

Properly conducted campaigns of rat-proofing, rat-trapping and destruction of

possible rat harborages will go further to eliminate the rat population of the United States than any other combination of methods so far employed. The states of Texas and Louisiana have issued pamphlets and circulars descriptive of these methods. Municipalities will do well to enlist the co-operation of the organized health agencies of these states.

Let each municipality set aside a certain period of days wherein a concerted effort shall be made to destroy as many rats as possible, and let the war-cry of the cause be

"Get Your Rat."

Motion Pictures Show Road Building

THE United States Bureau of Public Roads, Washington, D. C., has completed for free distribution and use in picture houses as well as at conventions, educational conferences, etc., throughout the country, two reels of pictures showing in detail the construction of the various types of asphalt roads. The pictures were produced particularly for the purpose of showing how best results may be obtained in asphalt construction. They are loaned to responsible parties free of charge, except for transportation costs.

The first reel, entitled "Building Bituminous Roads," indicates the wide application of bituminous materials in highway construction. It shows the character of the bituminous materials and demonstrates the principal laboratory tests used in determining their suitability for the various types of roads to meet various climatic and traffic conditions. A portion of the reel shows in detail all the various steps that should be taken in surface-treating a macadam pavement. This scene opens with a large motor truck distributor spraying the bituminous material upon a macadam surface in the suburbs of Philadelphia, Pa. The distributor is followed closely by a horse-drawn wagon spreading the stone chip covering. The bituminous macadam pavement is a type much superior to plain or surface-treated macadam. In its construction the asphalt is treated and applied either by mechanical or by hand distributors.

The use of the small hand pouring pots in applying the asphaltic binder is demonstrated on a road near Pittsburgh, Pa. This

demonstration is followed by views showing the mechanical distribution of the asphalt by motor trucks on a project in Westchester County, near New York City. The trucks are first shown loading at a railroad siding from huge tank cars. They then leave for the road, where the material is applied under pressure at the rate of one and one-half gallons to the square yard. Laborers are pictured covering this material with stone chips. A powerful roller then compacts the pavement. The road is then shown, by the passing of traffic, to be ready for immediate use. According to engineers, one of the big advantages of asphalt pavements is that they can be opened to traffic as soon as constructed.

The second reel, entitled "Building Mixed Asphalt Pavements," shows methods used in constructing both the asphaltic concrete and the sheet asphalt types of pavement. This reel contains views of plants at Pittsburgh, Pa., and Columbus, N. J., where the stone, sand and asphaltic binder are heated and mixed. The "mix" is loaded upon trucks and hauled to the road. Here it is spread with rakes and then compacted by a roller. This picture shows that the mixed types may also be opened to traffic immediately after their completion. The pictures demonstrating the construction of asphaltic concrete roads were taken on a new road under construction between May's Landing and Pleasantville, and leading into Atlantic City, N. J. The pictures of sheet asphalt construction were taken on a road near Columbus, in Burlington County, N. J. This county now has sixty miles of sheet asphalt.

The Public Utility of Museums

By John Cotton Dana

Director, Newark Museum Association, Newark, N. J.

"PUBLIC utility" is a phrase borrowed from Lord Sudeley, of England, who has in recent years written much and spoken often in the House of Lords in favor of an increase of the work of museums in the field of general education. The Newark Museum, in the twelve years of its existence, has done all that its modest collection, limited income and restricted quarters in the Public Library building would permit, to make its objects and the labors of its staff of interest and value to its owners and supporters, the people of Newark.

We begin with the children of the city, of course. For them we have several thousand objects which teachers in the schools use to make books and studies more attractive and intelligible. The teachers select what they wish, and the Museum sends to their schoolrooms two loads, in vans, each week.

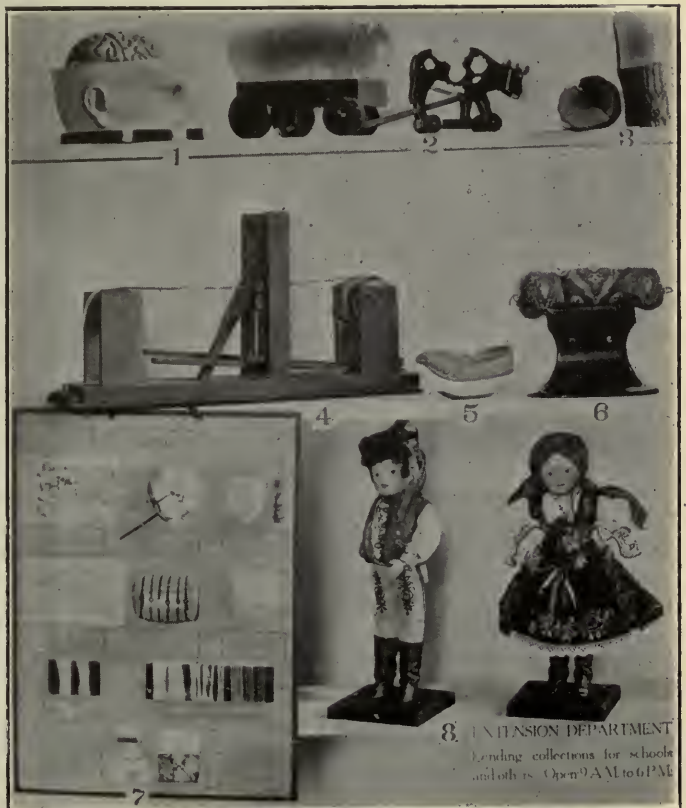
In the Museum is a room in which are always shown objects of interest to children, and often collections made and put up by children themselves. For a time, when space was available therefor, the curator of this "Children's Room" encouraged boy and girl collectors to form clubs to study birds, plants, stamps, wireless, etc., and these clubs prospered.

Our "theory of public utility" asks that we join with our public school teachers, our Shade Tree Commission, our County Parks Commission, our scientific clubs, etc., in developing, in our city and county parks, institutions with appropriate shelters and buildings, which will

promote interest in all aspects of outdoor life, in natural history, etc., with the Museum as an attendant and helpful spirit. This plan is here mentioned even though it has thus far been a subject for discussion only, because it speaks so clearly of our conviction that cooperation with existing agencies is fundamental to our theory of museum work.

Other Civic Organizations Must Use the Museum

To produce tangible results in the educational field, the Museum must ask teachers and managers of public and private schools not only to make use of its objects, but also to tell it, the Museum, what material they can best use, how they wish to have that



THE NEWARK MUSEUM LENDS THESE OBJECTS TO SCHOOLS

material prepared, and what direct personal assistance they can render in making the whole museum of "educational utility" to the community.

Museums have been content to acquire, preserve, describe and place on view objects within their chosen field, and then to say, in effect, that their duty is done, in that they give to those who wish to use them an excellent opportunity to come and see, and to learn of the worlds of art and of science, as their collections expound those worlds. The supporters of museums have been in large measure content to see museums assume this attitude of self-satisfied seclusion; but they begin now to realize that other existing public-supported agencies, established to expound the worlds of art and science to their supporters, can readily take and use much of the contents of museums and, with their aid, can add much of interest and effectiveness to their own educational activities.

England has begun to use museums in the field of industry. Finding that existing museums are, with rare exceptions, not even attempting to come into close and helpful contact with manufacturers, bench-workers, craftsmen and designers, it has formed an organization which is trying to give to these people an opportunity to learn from one another, and from their like in other countries, by displays of the factory and studio products of to-day. In Newark we were moved to attempt this work several years ago. To do it we needed the assistance of local manufacturers and importers, and we found it difficult to demonstrate to them the advantages that would follow the development in their city of a museum of "comparative industry"; a museum, that is, which should carry out the plan England is now developing, and should prepare for our producers, merchants and transporters a series of displays of local products with like products of other cities.

We therefore took a wider range, that of the whole state of New Jersey, and in two successive years collected and showed thousands of finished objects, and objects illustrating processes of production, in the fields of clay and of textiles. The two exhibitions were, of course, only modest experiments, but they seemed to demonstrate the truth of that part of the theory of the value of "greater public utility of museums" which

lies in the statement that a public museum should present its supporting community to itself as an organization functioning for production.

Museums Should Expound Foreign Industrial Conditions

It is a habit of museums to gather from other countries things rare and peculiar—old art products, objects explanatory of religion and social manners and of the development of these. That is, they gather art curios and ethnological specimens.

That is all as it should be. But museums should also gather and display objects which, with the help of maps, charts, diagrams, legends and pamphlets, shall expound to farmers, workers, manufacturers and distributors the resources, products and potential needs of other countries. These displays need not be and should not be permanent. They would include no "museum pieces," those things that persistently so obfuscate museum managers as to make them unable to see the moving picture of the world as it is. These presentations would, each for a few weeks or months, present to our makers, buyers and sellers the industrial aspects of a given country, and then would be dispersed.

In Newark we tried out this suggestion and produced, in due course, quite an interesting picture, in object, map and legend, of the Republic of Colombia. Again this was an experiment only; but it seemed to show that any museum can arouse in its community an alert and informed interest in the character and the future of any country whatsoever.

Other museums which can be called veritable public utilities are the American Museum of Natural History in New York, which has long pursued "public utility" and overtaken much of it, as any layman can learn who will send for a sample copy of its beautiful monthly journal, *Natural History*; the Philadelphia Commercial Museums, which pursue not only the industrialist to his great pleasure and profit, but also Pennsylvania's public school system to the gratification of its teachers, as one can learn by asking for a copy of one of its recent reports; and the Educational Museum of St. Louis, which is more than a museum that helps on the work of the city's public school system, for it is a component part of that system itself.

How a Municipal Plant Kept Down the Cost of Gas and Water

By D. A. Reed

Manager, Water and Light Department, Duluth, Minn.

THE history of the Duluth gas and water plant dates from the year 1883, when the work of construction was inaugurated by the Duluth Gas and Water Company, a private company organized for that purpose.

The source of supply for the water was about a mile east of the center of population, on the north shore of Lake Superior, with an intake extending some 700 or 800 feet into the lake. The water at this location became so contaminated in the next five or ten years by sewage discharged from several sewer outlets that two violent typhoid epidemics resulted, with 60 to 70 deaths. The rates were high, the service poor, and the water bad. Several attempts were made to purchase the plant, and several times when the question was submitted to the people it was either lost because of the high price asked, or because of invalidation by the court.

The first price considered was over two million dollars. The plant was finally purchased and turned over to the city in 1898 for \$1,250,000. At that time there was 40.6 miles of water-mains and 29.56 miles of gas-mains. At present there is approximately 185 miles of water-mains and 175 miles of gas-mains, which represents a plant over five times its original size when taken over by the city 23 years ago.

The gas plant has been moved to a new and more favorable site, and two new holders of 200,000- and 500,000-cubic-foot capacity have been erected in addition to a new holder of 1,000,000-cubic-foot capacity erected by the Zenith Furnace Company, the concern from which gas is purchased at the present time.*

* No gas has been made at the Duluth plant since 1908. The Zenith Furnace Company operates a smelter and coke oven plant. The gas is generally considered a by-product, although at the present time the company is making only coke and gas, not having operated the smelter for some months. The city's contract price with the Zenith Furnace Company is 37½ cents a thousand cubic feet for all gas except that used for house-heating purposes. The house-heating gas is 32½ cents. Owing to the fact that the company has for the past few months been operating only its coke ovens, the department has been paying a flat rate of 40 cents per thousand cubic feet.

During this 23-year period the total number of water customers has increased from 2,113 to 13,826, and the gas customers from 1,111 to 15,571, or an increase of over 9 to 1. The value of the plant has increased from \$1,250,000, the sum paid for it in 1898, to \$5,487,333.08 on the first day of January, 1921. The average number of gas meters per mile of mains has more than doubled, and the number of water meters has trebled.

Not only has the water plant paid its way, has been self-sustaining, but the customers, who have furnished all revenues, have acquired a proprietary interest in the plant of nearly a million and a half dollars. It has created a depreciation reserve of nearly one million dollars, has passed the peak of its indebtedness, and is now steadily retiring its bonds as opportunity offers for their purchase. Except for a refunding issue in 1906 of \$295,000, none of the bonds have yet become due, and none will mature until 1926; consequently, they cannot be retired, except on the consent or request of the holder. With one exception, every bond that has been offered has been retired. How has it been accomplished? From its earnings? With one exception, every cent of it.

For a brief period the taxpayers contributed a one-half-mill levy for the support of the water and light plant. It was quickly recognized, however, as being a mistake, and the income was relinquished, on the suggestion of the department itself, in 1914. With this exception, the plant has never received a cent of support from the city, the taxpayers or any other interests, except what it has honestly earned by service rendered, and it has not always received pay for that. True, it does not pay taxes, but it renders a service to the taxpayers in its hydrant service that costs the department \$110,000 a year, and which, if the city of Duluth had happened to be just across the river in the state of Wisconsin, the Wisconsin Railway Commission would have ordered paid. The city allows about one-half of this amount, or \$55,000 a year, for the hydrant service that costs the department \$110,000.

The difference between the cost of this service and the amount paid for it by the city may be fairly considered as a contribution in lieu of taxes.

The Question of Rates

Since 1898, when the city took over the plant, the following rates have been in effect:

GAS		
	Light	Fuel
1898.....	\$1.90	\$1.00
1899.....	1.40	1.00
1901.....	1.25	1.00
1902.....	1.15	1.00
1903.....	1.00	1.00
1904.....	.90	.75
1905.....	.90	.75
1906.....	.75	.75
1909—		
Light and fuel, \$.75; all over 50,000 cu. ft., \$.50		
House heating, any quantity, \$.50		
Minimum bills, \$.25 per month		

WATER		
1898.....	\$.30	per 100 cu. ft.
1901.....	.25	per 100 cu. ft.
1907.....	.17½	per 100 cu. ft.
1913—		
8,000 cu. ft. at \$.17½ per 100 cu. ft.		
8,000 cu. ft. at \$.10 per 100 cu. ft.		
60,000 cu. ft. at \$.07½ per 100 cu. ft.		
100,000 cu. ft. at \$.05 per 100 cu. ft.		
All over at \$.02½ per 100 cu. ft.		
1914—		
10,000 cu. ft. at \$.15 per 100 cu. ft.		
10,000 cu. ft. at \$.12 per 100 cu. ft.		
All over at \$.08 per 100 cu. ft.		
Minimum bills, \$.50 per month		

No rates for either gas or water have been changed since January 1, 1914. While the era of high prices has swept over the entire world during and since the war and has increased the salary of every employee of the department below that of the manager, some of them being doubled, has more than doubled the cost of cast iron pipe and of pig iron, has increased the price of coal for making gas and operating its pumping stations, has increased the cost of electrical energy, still the price of gas and water has remained the same without a single change of any kind for the past eight years. Further than this, the profits of the department were never higher in any previous year than for 1920, and for the combined plants were \$174,381.41. And still further, there is not another place, town or city, anywhere in North America, so far as the writer has been able to discover, where manufactured gas is sold for 50 cents or 75 cents. If there is, the writer will be grateful to anyone that will furnish him the information.

Policies That Have Brought Success

Experience develops policies. Policies are subject to the law of the "survival of the fittest." The policies that survive gradually become so established that, although unwrit-

ten, they become law; for instance, in these plants:

1. All charges are based upon cost.
2. No material service is ever rendered free of charge.
3. No price is ever cut to retain a customer, or for any other reason except to correct an error.
4. All customers pay the same price for the same service.
5. No charity is ever extended, except when the recipient bears a certificate from the clerk of the Poor Board.
6. Every complaint is given the utmost consideration and courtesy.
7. No charge is ever based upon what the traffic will bear.

As to financial matters:

The Division of Public Utilities has its separate fund, which is not mixed up in any way with other city funds.

All revenue derived from the sale of gas and water is turned into this fund.

All interest charges and bonds retired are paid for from this fund, as well as all pay-rolls, construction accounts, and other items of expense in the operation of the plant.

Extensions and betterments are paid for, as far as may be practicable, from the current earnings.

Bonded indebtedness is reduced as rapidly as possible.

Covering the personnel are the following:

All permanent employees are under civil service rules, and no applicant can be placed on the eligible list until he or she has passed the required examination.

All vacancies are filled by promotion from lower ranks, when practicable.

Selections for higher positions are made on the basis of past efficiency.

For misdemeanors or inadequacy of service, the penalty is suspension without pay.

Again let it be said, do not grant special privileges to anyone and do not ask for any for yourself or for the plant which you are trying to manage. The largest and most destructive argument that has ever been leveled against public ownership is that the plant is self-supporting because it enjoys the special privilege of exemption from taxation. The director of the Taxpayers League was surprised when we told him that we were perfectly willing to pay taxes on exactly the same basis as any other utility, but that we wanted the Taxpayers League to see that we received full pay for the hydrant

service. With this argument settled, there remains only one other shot that they can fire, and that is that we enjoy exemption from the payment of cash dividends on the money invested. In our case this would be, say, 8 per cent on \$1,445,000, or about \$115,600 a year. This amount would take quite a slice from our net earnings, but to whom would we pay the dividends? To our customers, of course, for they are the ones who have invested their money in the plant. But why tax these same customers in order to pay back to them dividends which can be paid just as well in reduced rates, and which are being paid in reduced rates, and which, as they gradually come to own the entire

plant, free from all debt, they will receive as maximum cash dividends in reduced rates every time they pay a water or a gas bill?

The public ownership of this plant has had a most wholesome and steadying effect upon other utilities privately owned. Seven years ago the electric light plant had either to turn its plant over to public ownership or to reduce its rates. On an appeal to the voters, it chose the latter, and the people voted against purchase by the city. It has not asked nor tried to raise its rates during or since the war. The Street Railway Company is still operating on a 5-cent fare.

ACKNOWLEDGMENT.—From a paper read before the Public Ownership League of America, in Chicago, Ill., in November, 1921.

The Health of City-Dwellers Demands Shaded Open Spaces



THE COMING OF HOT WEATHER REMINDS CITIZENS OF THE DEBT THEY OWE TO THOSE WHOSE FORETHOUGHT PROVIDED THEM WITH SUCH PARKS AS THE ONE SHOWN ABOVE

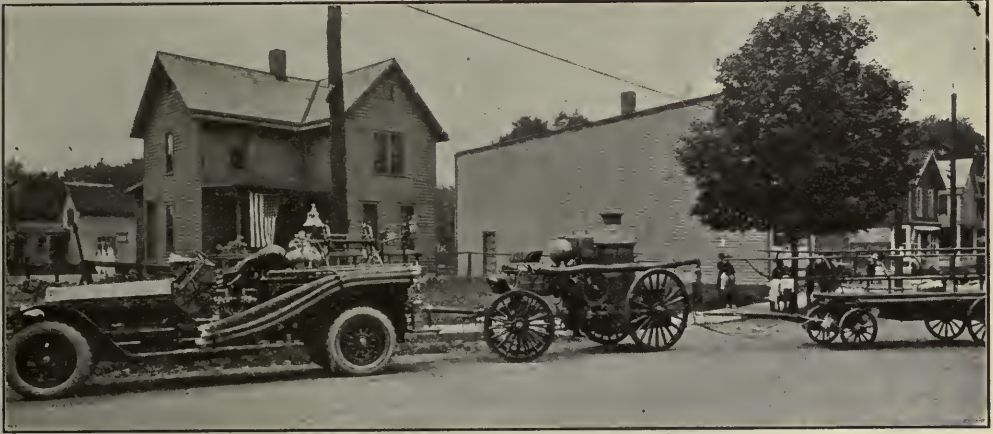
Progressive American Cities Use Motor Equipment in Many Departments



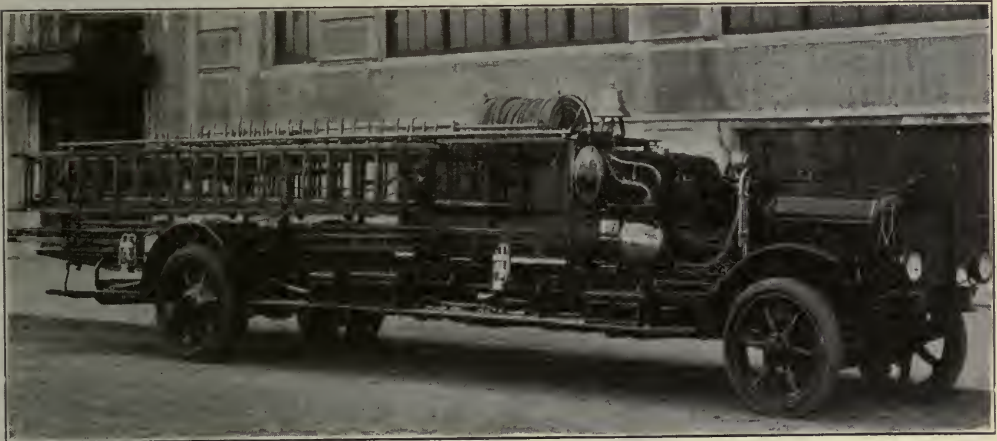
"SOUTH BEND" SPRINKLING OUTFIT ON FEDERAL TRUCK, IN THREE RIVERS, QUEBEC



THE CITY OF MEMPHIS, TENN., USES THIS OUTFIT FOR ROAD WORK WITHIN CITY LIMITS
The 5-ton Holt tractor was sold by the Halloran-McLean Tractor Company, Inc., Memphis, Tenn. The grader is a Stockland Special Quick-Lift machine with 8-foot blade



THREE AGES OF FIRE FIGHTERS EXHIBITED BY THE AMERICAN-LAFRANCE FIRE ENGINE COMPANY AT THE ELMIRA CONFERENCE OF NEW YORK STATE MAYORS AND OTHER MUNICIPAL OFFICIALS



ONE OF NEW YORK CITY'S NEW FLEET OF TEN 5-TON CITY SERVICE TRUCKS

These White trucks have a 245-inch wheel-base and are equipped with 50-horse-power motors. The ladder equipment, supplied by Peter Pirsch, includes one 55-foot ladder, one each 40-, 30-, 25- and 18-foot ladders, and one 16-foot extension ladder. The trucks also carry a 40-gallon chemical tank and 200 feet of $\frac{3}{4}$ -inch chemical hose



A GROUP OF DUMP BODY MACCARS USED BY THE DEPARTMENT OF HIGHWAYS, BOROUGH OF BROOKLYN, NEW YORK CITY

Transforming an Old Waterway Into a Roadway

Utica Replaces the Erie Canal with a New Street

By Charles Martel Niles

TIME brings inevitable changes. The mechanical marvel of to-day may be on the scrap-heap to-morrow. Therefore, it is not surprising that the Erie Canal in the city of Utica, N. Y., is to be abandoned after a century of service. When the original canal was thrown open to traffic a hundred years ago, the people of Utica

Under Twentieth Century conditions the usefulness of the canal began to wane. Its benefits were more than offset by its many disadvantages. Lift bridges, with their concomitant delay and expense, had to be maintained on all the principal streets in the center of the city. Elsewhere there were many elevated spans with high approaches,



GRADING PREPARATORY TO REMOVING HIGHWAY BRIDGE WITHOUT INTERRUPTING TRAFFIC

celebrated the occasion with great rejoicing, rightly believing that the canal would be of enormous commercial benefit to them. Now they are equally enthusiastic over the elimination of the canal in the interest of Twentieth Century progress.

Flowing from west to east, the old Erie Canal practically bisected the business section of the city. It was the only means of water transportation that the city possessed until the opening of the new Barge Canal. In the course of time the banks of the old canal became lined with warehouses and manufacturing plants. Long after the advent of the railroads it continued to play an important part in the commercial affairs of the city.

which produced an equally undesirable situation.

With the opening of the Barge Canal in 1917, the situation suddenly became acute. The Barge Canal took part of the water which had previously supplied the Erie Canal and there was not enough water left to maintain the level required for navigation in the older waterway. Careless people used the canal channel as a dumping-place for every imaginable kind of refuse. The old bridges were unsafe for heavy motor trucks; in fact, trucks broke through the flooring on several occasions.

By the referendum adopted at the general election in 1918, the city obtained the right to close the canal between Schuyler Street

and Third Avenue, a distance of about three-quarters of a mile, providing a conduit were constructed to maintain the flow of water in the remaining portions of the canal.

With all the legal obstacles cleared away at last, plans were formulated for the construction work necessary to the elimination of the old canal. It was decided to begin by building 1,100 feet of reinforced concrete conduit, which would permit the closing of the canal in the busiest part of the city and the removal of three particularly objectionable bridges. The conduit was designed to have a gradient of .045, giving a capacity of 90 second-feet, which was deemed sufficient to maintain the water-level in the canal east of the fill. The conduit follows the north side of the old canal-bed close to the former tow-path.

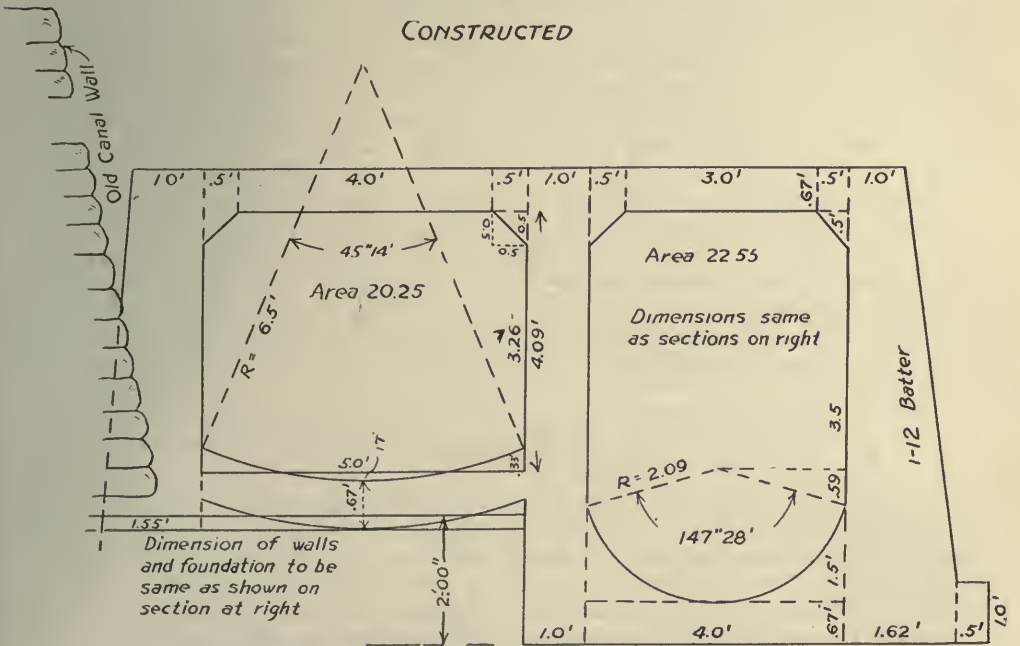
The conduit has a peculiar cross-section. It consists of two covered channels of nearly equal carrying capacity, but different shapes. The channel nearest the canal bank is 5 feet in width and 4 feet deep, with a slightly curved invert. The southerly channel is 4 feet wide and 6 feet deep and has a semi-circular bottom. The tops of both channels are at the same elevation, so the invert of

the deeper one is 2 feet lower than the other. This type of construction was adopted so that the deeper channel may be converted into an intercepting sewer if at some future time the canal should be entirely closed. It would be used for sanitary sewage only and would be extended to a contemplated sewage disposal plant east of the city.

The conduit was built with city forces, as that was considered the most economical method under existing conditions. The old tow-path provided an ideal location for the portable concrete mixer, and a ready route for bringing up the aggregate. The elevation of the tow-path was sufficient to permit the product of the mixer to be chuted directly into the forms. Collapsible wooden forms in 10-foot sections were designed and built especially for the job. The conduit rests on an 8-inch bed of concrete. The partition wall between the channels is 1 foot thick; the outer walls are a foot through at the top and have a batter which makes them about 18 inches wide at the base. The top is 8 inches thick. Top and sides are reinforced with heavy expanded metal. The job required about 2,200 cubic yards of concrete.

SECTION A

CONSTRUCTED



ELEVATION SHOWING METHOD OF BUILDING DUAL CONDUIT

Some of the Difficulties

On account of the unusual weather which prevailed during the winter of 1920-21, the conduit construction was alternately menaced by frost and flood. Zero temperatures alternated with thaws, resulting in frequent floods, which several times threatened serious damage to the work. A temporary dam was built across the canal channel at each end of the conduit site. Pumps were installed at the lower end of the conduit to keep the work properly drained. On one occasion when high water seriously menaced the partly completed conduit, reserve fire engines were used to help pump out the pit. In freezing weather the sand, stone and water were heated and the finished concrete was protected with a layer of earth or straw.

As the construction of the conduit progressed, the filling of the old canal channel followed closely. A large amount of ashes and trash collected about the city was used for filling; also cinders from boiler plants. In this way the expense of making the fill, which contained about 22,000 yards, was comparatively small. A top dressing of clean earth was placed on the fill. Jay Street, which formerly met the canal at an acute angle and ended there, will eventually be extended along the new fill to Hotel Street. This will provide a new cross-town thoroughfare, which will help to relieve traffic congestion in the busiest part of the city.

The conduit was first built under the three bridges to be removed, and the intervening portions were then constructed. The filling was brought up close to the floor of the bridges before the planking was removed. Then all superstructure was razed, the whole work being accomplished with practically no interruption of traffic. The old, unsafe bridges at Hotel and John Streets were removed first. The material in

the bridges reverted to the state under the provisions of the special act.

Removing "the Hump"

The removal of the bridge at Genesee Street, the principal business artery of the city, presented a peculiar problem. It was in reality three bridges in one. The central part of the bridge was a high truss span with its floor raised about 7 feet above the grade of the street. It had long elevated approaches and carried a double-track trolley line. This structure was locally known as "the hump," and its elimination was one of the main objectives of the entire job. At each side of the trolley bridge were heavy plate girder spans at the street grade. These were lifted by pneumatic pressure when the canal was in use.

The east lift was removed first, and temporary trolley tracks were laid on the fill. Then vehicular traffic was routed over the trolley bridge while the west lift was being taken away. The heavy plate girders were moved intact through the city streets a mile to the Barge Canal harbor, whence they will be taken and used elsewhere by the state. Finally, the high bridge and its approaches were razed and the trolley tracks relocated in their permanent position. The entire street for a distance of 600 feet will be regraded and newly paved as soon as the fill has safely settled.

Thus, after a twelve years' fight for civic betterment, this splendid improvement is now nearing completion. The expense has been met by the issuance of bonds. The cost of the entire job, including conduit construction, filling, removal of bridges and paving, will be approximately \$150,000. This expenditure will be many times repaid by the economic and esthetic improvement to the business section of the city; in fact, the entire community will be immensely benefited.

Road Accidents Minimized in Maryland

The Highway Commission of Maryland, which received \$1,600,000 for highway maintenance and construction in 1921, adopted the policy that in addition to the ordinary maintenance, special attention should be given and money expended to eliminate danger points on the roads and thus reduce accidents to a minimum. With this in view,

a system was worked out whereby every accident on the state road system is reported daily and is represented by a colored tack on a large map in the office of the Chief Engineer. An intelligent study of this map shows the points or sections of road that need immediate attention.—*Highway News Digest.*

Chamber of ***** Commerce Activities in Public Affairs

Successful Campaign for City Water Plant

STEVENS POINT, WIS.—Two water questions submitted to voters of the city at a special election held Wednesday, February 8, were carried by overwhelming majorities of more than 9 to 1. Municipal ownership of the local water utility, as well as the development of a new source of supply, is now a certainty as a result of the election.

The two questions submitted to the voters were:

(1) The purchase of the plant of the Stevens Point Water Company for the sum of \$175,000 plus the actual cost of the construction of mains in the streets since June 1, 1921; and (2) providing for the issuance of bonds in the sum of \$100,000 for the construction of a pumping station in the Plover River basin. The strength of the supporting votes and the weakness of the opposition proved the only surprise of the election. While it was generally predicted that both questions would win, even those who were most confident looked for a vote less decisive. In every ward both questions voted upon carried by heavy majorities, and the victory is considered a clear-cut expression of just how strongly the people of the city feel the need of a good water-supply.

About six years ago, the voters had an opportunity of expressing their desire for the purchase of the Stevens Point Water Company's plant, but the issue was defeated by 10 to 7, and the matter was allowed to drift along until the Chamber of Commerce undertook to revive the issue.

The Board of Directors of the Chamber felt that before the question of purchase be again voted upon, steps should be taken towards locating and developing a new source of supply of pure, wholesome water, and after much labor persuaded the City Council to appropriate a sum of money sufficient to retain the services of a hydraulic

engineer. This was done, and W. G. Kirchoffer of Madison was engaged. After the usual preliminary surveys, he advised the Council, through the Chamber, that he had located a supply of spring water in quantities sufficient to serve a large city. The Council then voted a sum of money with which to purchase the 40-acre tract of land upon which the springs were located; options were secured from the owners of the present water-works company, and at the election of February 8 the citizens indicated by their vote that they had had enough bad water and were in favor of purchasing the present plant, developing the new supply and making this utility a municipal one.

F. LESLIE BODY,
Secretary, Stevens Point Chamber of Commerce.

How One City Fosters Respect for Citizenship

LOGAN, UTAH.—Birth, marriage and death—we are told that these are the three noteworthy events in any one's life. But the city of Logan has added a fourth—when young men and young women attain the dignity of citizenship they are publicly banqueted in honor of the event.

On the last day of January of this year, nearly 150 of the young people of Logan who had attained their majority were entertained by the city, the Logan Chamber of Commerce, and other civic organizations in the first of what promises to be an annual celebration. While other communities have seen fit so to honor their naturalized citizens, Logan is the first city to show this consideration to its own sons and daughters who have gained the right to vote.

The whole affair was planned to give the young voters a proper respect for the ballot, to show them that along with the privileges of citizenship go many responsibilities, to teach them some of the principles upon which their government stands—in short,



Do you realize what 30% longer life means on the concrete roads you build?

Read this book and find out!

Just think of it! Concrete that stands the crunching grind of traffic 30% better! Concrete that stands up 30% longer under the constant gnawing of the elements! The ability to give the taxpayers a road like that adds something to a man's reputation.

But that isn't all. Hard-n-tyte reduces the problem of maintenance to almost nothing. When Hard-n-tyte goes on a concrete road, your worries about soft spots, ruts or crumbling stop! The weather-proof silicates and fluorides formed by flushing the

Hard-n-tyte solution over the road, produce a flint-hard surface that will stand up under the hardest kind of traffic for many years to come.

But all the things you want to know about lengthening the life of concrete can't be told here, so send in the coupon below for your copy of the booklet, "Hard-n-tyte Highways." Send for it today—it tells the whole story.

General Chemical Company
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Hard-n-tyte Road Treatment

—makes concrete roads wear longer

GENERAL CHEMICAL CO.,
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Please send me a copy of "Hard-n-tyte Highways."

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Mail this Coupon to us NOW!

For over twenty years the General Chemical Company has been at the forefront of chemical research and manufacture in this country. Hard-n-tyte is the latest contribution of its splendid staff of chemists. It is the successful result of long search for a concrete hardener that really hardens the surface and materially increases its life. It enables engineers and contractors to deliver a quality of concrete work far in advance of anything that has been possible heretofore.



A BANQUET WAS GIVEN TO THE NEW CITIZENS OF LOGAN, UTAH

to make of them better Americans. As one citizen expressed it:

"When I attained the right to vote, I knew nothing of the sacred duties this right entailed. It had cost me nothing and was, as far as I could tell, worth nothing. Only after years of experience did I begin to realize that I held in my hands one of the most sacred political rights which it is given man to possess. I believe that, if we can bring our young citizens to an early realization of the power and sacredness of the ballot, we have done much to elevate the ideals of democracy."

Logan's first "New Citizens Night" was admirably planned. At six o'clock on the evening of January 31, the young people sat down to a banquet. Representatives from various organizations in the city were placed among the young people to aid in their entertainment. Songs and stunts enlivened the affair and put all in the right mood for the more serious toasts of the evening. A number of citizens, in costume, took the parts of immigrants from various countries and, during the course of the banquet, criticized severely the institutions of our government, only to be answered in vigorous speech by the young citizens. A local attorney, responding to the toast, "The Vote," told of the privileges and responsibilities that go with citizenship. A local club woman, in toasting "The Future Woman," outlined the duties that the woman of to-morrow must hold sacred.

Following the banquet, a great public meeting was held, at which the new citizens were special guests. After the singing of patriotic songs, Chief Justice Frick of the Utah Supreme Court explained the fundamental principles of American democracy and showed that a clear understanding of the government of the United States comes from a mastery of the truths in the Declaration of Independence."

D. E. ROBINSON,
Agricultural College of Utah.

Chamber Promotes Model Market-House

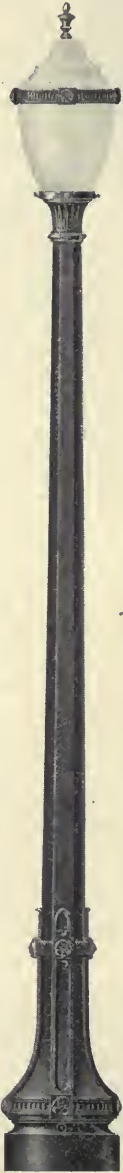
LEXINGTON, KY.—"Not a morsel of food for a fly to light upon" is the slogan and the achievement of Lexington, Ky., in the construction of a modern market-house that spells the last word in science and sanitation so far as consolidated markets are concerned.

The building is a model of compactness, convenience and completeness, and is well worth the study of any community interested in modern methods of food merchandizing and in making its market an asset instead of an eyesore to the city. Lexington claims to have in its new market-house features that are not to be found in any other municipality and that represent the latest and best methods of handling and retailing food products.

Before tenants are permitted to take over the stalls, all fixtures are set up, including cash registers and scales, and are uniform throughout. Sealed glass cases, of newest type, are used for holding and displaying perishable wares. The entire basement is given over to the operation of a refrigerating plant and dry storage, with individual spaces for each tenant of the building. Cleanliness marks the handling of food products from the time they are placed in the refrigerator until they reach the customer in his or her home.

The main floor, with its booths for groceries, meats, vegetables, drugs, soda, coffee, fruits and flowers, maintains a system for serving all the household needs of the customer in the shortest time possible. All deliveries are made through a central automobile delivery service, and a central telephone switchboard directs a cooperative service of taking and filling orders. A comfortable rest room, with writing and telephone facilities, is provided on the mezzanine floor, overlooking the quiet, cleanly scene of efficient marketing service going on below.

The project originated in the Lexington Board of Commerce and was worked out under the direction of Dyer J. Lockwood and an engineering corporation experienced in such work, after studying the plans, de-



*Beauty and
Efficiency*

HOLLAND, Michigan, was the first to decorate their streets with this wonderful French design lighting standard created by the General Electric Company and manufactured by the King Manufacturing Company.

King Manufacturing Co.
53 West Jackson Blvd.
CHICAGO ILLINOIS

KING
WHITE WAY POSTS

fects and possibilities for development of similar enterprises in other cities throughout the country.

C. F. DUNN,
Secretary-Manager, Board of Commerce.

A New Hospital for Keene, N. H.

KEENE, N. H.—For many years the local hospital facilities of Keene had been inadequate. In December, 1920, the Chamber's Committee on Activities, through a questionnaire, showed the community to be united in realizing the need of a new hospital. Backed by this sentiment, a committee from the Chamber of Commerce, the Board of Trustees, and the Board of Health met, and through their efforts a new Board of Trustees was elected, which was ready to carry out a program to build a hospital. By newspaper publicity, bulletins, and various other means, the need of a hospital was brought prominently before the people, who were ready to support the new Board of Trustees in this undertaking.

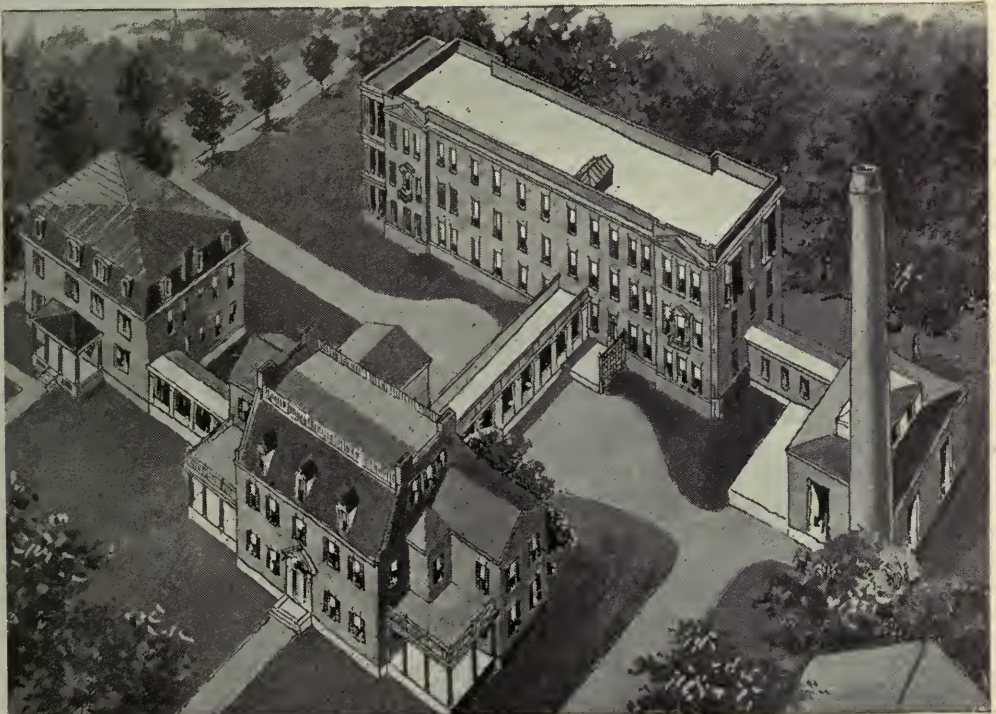
The organization for the drive, which resulted in raising \$275,000 for a new hospital, was as follows: the Executive Committee,

composed of representatives from the chief organizations in the city; four joint chairmen—two men and two women; twenty-four teams in the city, of eleven members each, and one in each of the towns in the county. At the head was a professional organizer, brought into the city for the purpose of giving all his time to the campaign. The actual campaign required seven weeks, only ten days of which were consumed in actual solicitation. The campaign had all the characteristics of an intensive war drive and was entirely successful. Not only was there \$50,000 over-subscription, but the community spirit was the best that we have yet seen.

PRICE GAINES,
Secretary, Keene Chamber of Commerce.

Volunteer Labor Rebuilds Highway

CANON CITY, COLO.—Colorado roads suffered heavily the past season from heavy rains and floods. The county and state appropriations could not take care of the expense of restoring them to normal condition. The citizens of Canon City had al-



THROUGH THE EFFORTS OF THE CHAMBER OF COMMERCE \$275,000 WAS RAISED TO BUILD THIS HOSPITAL AT KEENE, N. H.



Broadway High School Annex,
Seattle, Washington.

F. A. Naramore, Architect

ALUNDUM SAFETY TILE USED ON ALL INTERIOR STAIRS.

MODERN SCHOOL PRACTICE REQUIRES SLIP-PROOF CONSTRUCTION

Making stairs and hallways safe for careless children has been a big problem. Stairways, ramps, floors and walks must and can be made safe for flying feet, even in wet weather.

ALUNDUM SAFETY TILE will prevent the slips and falls that invariably occur on ordinary surfaces. School buildings throughout the country are being equipped with this slip-proof, indestructible tread on steps and floors of every kind. Made in different colors and used either alone or in combination with other tiles to produce a slip-proof surface.

It never wears smooth and will last as long as the building. It is economical. Data for architects and other information may be obtained on request.

NORTON COMPANY
WORCESTER, MASS.

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New York

11 N. Jefferson Street
Chicago

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Detroit

ready demonstrated that roads could be constructed by volunteer labor, having built over two miles of mountain road to open up a new scenic attraction and rebuilt the Royal Gorge road three different times.

The beautiful Phantom Canon highway was rendered impassable by floods. This road covers a distance of 32 miles, extending between Canon City and Florence to Victor and Cripple Creek. It looked like a hopeless task to restore the road to travel. State engineers made estimates of \$90,000 to rebuild. The indomitable local spirit prevailed, and the citizens of Florence made up their minds that this scenic highway must be restored. They set the ball rolling. The first day's call resulted in a response from 150 men of all classes. They followed this up for four days with from 50 to 60 men each day. The progress was amazingly fast. The cooperation of Canon City, Victor, Cripple Creek and Penrose was then requested, with the result that each day saw from 75 to 150 men working like Trojans. By the end of the second week this magnificent highway was again open to travel. Another view of the highway appears on the cover of this issue of THE AMERICAN CITY.

E. A. BRADLEY,
Secretary, The Chamber of Commerce.

Fire Prevention Propaganda in Newark Schools

NEWARK, N. J.—To gain temporary possession of the silver cup shown in the accompanying picture, pupils of the South Market Street Grammar School of Newark, N. J., submitted 208 essays in connection with the observance of Fire Prevention Day last year. The prize was offered by the Insurance Section of the Newark Chamber of Commerce to the school sending in the largest number of compositions on "Home Inspection to Prevent Fires." The cup will be



RUGGED COUNTRY FOR ROAD BUILDING

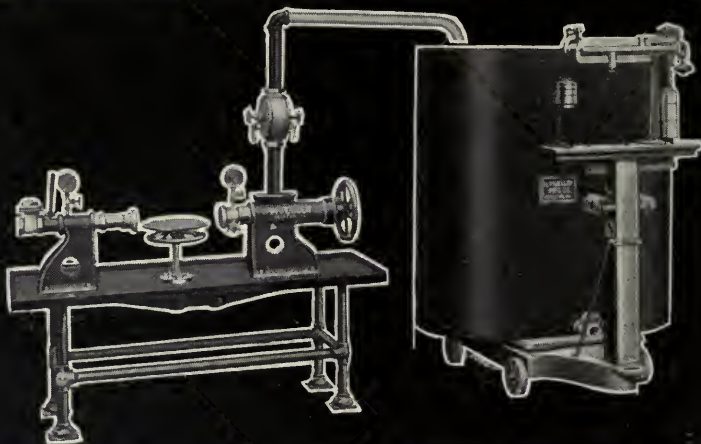
But citizens of Florence, Canon City, Victor, Cripple Creek, and Penrose, Colo., put the road through

contested for annually, and permanent possession will be attained only upon three successive awards of the prize. Inscribed on the cup, leaving space for future inscriptions, is the following:

"Fire Prevention Day—October 9th, 1921—School



THE PRIZE OF THE FIRE PREVENTION ESSAY CONTEST OF NEWARK, N. J.



Mueller Water Meter Testers

Experienced Water Works men test new meters before they are installed. It's important to know that the meters are correct—because they measure the volume of water passing through to the consumer. *They tell how much the consumer uses.*

Testing a meter with the **MUELLER** is as easy and simple as telling time. After a certain amount of water is passed through the meter, a weight on the per cent bar of Tester is balanced and gives a correct reading of per cent of error, either over or under the normal or correct figure.

No company furnishing metered water can afford to be without a **MUELLER** Tester. A few large meters under-registering will lose more money for the company in a year than the cost of a **MUELLER** Water Meter Tester.

Detailed descriptions and prices on request.

H. MUELLER MFG. CO., DECATUR, ILL.
PHONE BELL 153

Water, Plumbing and Gas Brass Goods and Tools.

New York City, 145 W. 30th St.,
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Sarnia, Ontario, Canada

Mueller Metals Co., Port Huron, Mich., Makers of "Red Tip" Brass Rod; Brass and Copper Tubing; Forgings and Castings in Brass, Bronze and Aluminum; Die Castings in White Metal and Aluminum; also Screw Machined Products.

Prize—Annual Competition—Fire Prevention Competition—Permanent Possession with Three Successive Awards—Awarded by the Fire Insurance Section of the Chamber of Commerce of Newark, N. J., to the South Market Street School for submitting the largest number of competitions in 1921 Contest.”

Three other cups were given as individual prizes for the best compositions submitted.

The essay contest was inaugurated last year and was conducted with the cooperation of the municipal Bureau of Combustibles and Fire Risks and the Superintendent of Schools. It was confined to the grammar schools, with the idea that the pupils of this grade would be more impressed with the purposes of the competition. There were 515 compositions submitted. It is confidently expected that this number will be vastly increased in the succeeding years of the contest.

E. W. WOLLMUTH,
Secretary, Chamber of Commerce.

San Francisco Chamber Will Offer Unique Service to City's Guests

SAN FRANCISCO, CALIF.—In line with the new program adopted by the San Francisco Chamber of Commerce, it is proposed to make this city known as the most hospitable city in the world; the idea is that the visiting guest or tourist is a potential asset if properly received. Hence, the Program Committee and the Chamber of Commerce have organized, under the leadership of Dr. B. M. Rastall, industrial engineer, for the purpose of extending the hospitality of the city to every visitor. It is planned to see that no one is permitted to go away without having received special courtesy and also an adequate and definite knowledge of the city's resources and advantages. So far this is the only American city to organize itself definitely for this purpose.

It is planned that every incoming steamship and transcontinental train shall be met by an authorized agent of the Hospitality Committee; that hotels and every recognized resource of the city shall cooperate to make San Francisco known as "The City of Hospitality." The visitor will be greeted on his arrival, and an ef-

fort will be made to find out his probable destination and to get any information which the visitor desires to give. This information is then sent by special messenger to the Hospitality Committee headquarters and filed, the visitor is assigned to his particular host, and the effort is started to make his visit one of profit or pleasure. As far as possible and practical, each visitor will be assigned to a host who is in his own line of endeavor.

The organization for this task is very definite and makes the entire scheme simple—not a burden on any one. Five thousand citizens have been asked to volunteer their services as hosts to the tourist or business visitors for three half-days each year; no one is asked to go beyond what he can afford to do, or to entertain in an elaborate way. He is asked to call on the visitor who is assigned him, extend the welcome of the city, and offer such suggestions as to the city's resources and points of interest as may seem advisable, with perhaps a tour of the city by automobile, or a luncheon. In fact, it becomes his business to see that his particular guest shall have the right knowledge of San Francisco, and shall leave it feeling that he has been really welcomed and that his particular mission (be it business or pleasure) has been definitely aided by the Chamber's representative.

Each host knows in advance just the particular half-day which he is expected to devote to this entertaining; thus the burden on him is minimized and the possibility is eliminated of a guest's arrival without a host to receive and entertain him. Nor is

TO SAN FRANCISCO CHAMBER OF COMMERCE

..... 192..

SAN FRANCISCO HOSPITALITY

I volunteer my services for THREE HALF DAYS during the coming year to the SAN FRANCISCO HOSPITALITY COMMITTEE. Upon advance notice by the committee I will hold definite dates exclusively for assisting and entertaining such guests as are assigned to me.

Name

MILEAGE

JUST how many thousand miles Osborn Push Brooms cover each day is impossible to estimate and it's of no importance—but it's a sure fact that they are in daily use in over 500 cities in the United States.

The present day development of our brush and broom business is the result of over 30 years experience. This wide experience, coupled with the findings of our Engineering Department and the tests of our Experimental Laboratory has naturally resulted in an ability to make brooms and brushes give unusual service.

An inquiry will bring, by return mail, prices and any further information wanted.

THE OSBORN MFG. Co.
INCORPORATED

New York
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San Francisco



OSBORN

BRUSHES

BROOMS

LARGEST MANUFACTURERS of INDUSTRIAL BRUSHES AND BROOMS

this service to be pushed to the place where the visitor is wearied.

If the visitor be one of prominence, committees will give special attention, and telephone and telegraph plans will be made for his pleasure and comfort. Many of the definite details of his entertainment will be left to the individual judgment of the host to whom he is assigned.

Naturally, for the first months the details of this plan for promoting the city's advancement will be in the making and will be changed as conditions may require; but there is little doubt that the opportunity offered by this movement will give San Francisco a unique position among American cities.

CHARLES A. SIMMONS,
Executive Secretary, San Francisco Chamber of
Commerce.

Removes Advertising Signs from Street Poles

NEW ORLEANS, LA.—One of the problems the Civic Bureau of the New Orleans Association of Commerce has had to face in giving the city streets a cleaner appearance is the prohibition of promiscuous tacking and placing of signs on the posts along the streets. Efforts, extending over a period of

more than a year, have proved successful, however, and although at times signs are still strung to posts, the cases are very scarce—in fact, almost negligible.

It was a hard fight to convince the police and city officials that the committee was right. They were reluctant to give up the chance of playing politics by allowing campaigns, with more or less merit, to use the streets for advertising purposes. The committee, however, with the law on its side asked only that the municipal ordinances be enforced. Violators were called to the attention of the police, and in several cases the signs were removed by the police before being put in place. Several firms that used the posts to advertise their private businesses were asked to stop the practice and have their signs removed, and, seeing the wisdom of the request, complied with it.

Throughout the whole period of the work, the local railway company and the telephone and telegraph company, owners of the posts along the streets, have cooperated with the committee. They have had old signs removed and have refused to allow anyone to tack or hang any advertisements on their posts.

A. K. SCHARFF,
Secretary, Civic Bureau, New Orleans Association of Commerce.

On the Calendar of Conventions

APRIL 19-21.—SPARTANBURG, S. C.
Tri-State Water and Light Association of the Carolinas and Georgia. Annual meeting. Secretary, W. F. Stieglitz, Columbia, S. C.
MAY 1-4.—NASHVILLE, TENN.
Southern Commercial Secretaries Association. Annual convention. Secretary, Roger Miller, Macon, Ga.
MAY 3-6.—DETROIT, MICH.
American Physical Education Association. Annual convention. Secretary, Dr. J. H. McCurdy, 93 Westford Avenue, Springfield, Mass.
MAY 9-11.—ATLANTIC CITY, N. J.
National Fire Protection Association. Annual meeting. Secretary, Franklin H. Wentworth, 87 Milk Street, Boston, Mass.
MAY 12.—NEW YORK, N. Y.
National Highway Traffic Association. Annual meeting. Secretary, Elmer Thompson, 247 West 54th Street, New York, N. Y.
MAY 15-19.—PHILADELPHIA, PA.
American Water Works Association. Annual convention. Secretary, J. M. Diven, 153 West 71st Street, New York, N. Y.
MAY 15-19.—ATLANTIC CITY, N. J.
National Electric Light Association. Annual convention. Executive manager, M. H. Aylesworth, 29 West 39th Street, New York, N. Y.
MAY 15-21.—WASHINGTON, D. C.
Chamber of Commerce of the United States of America. Annual meeting. Secretary, D. A. Skinner, Mills Building, Washington, D. C.
MAY 17-18.—WAXAHACHIE, TEX.
League of Texas Municipalities. Annual convention. Secretary, Frank M. Stewart, Government Research Division, Bureau of Extension, University of Texas, Austin, Tex.
JUNE 5-7.—SPRINGFIELD, MASS.
National Conference on City Planning. Annual conference. Secretary, Flavel Shurtleff, 60 State Street, Boston, Mass.

JUNE 6-7.—ANTIGO, WIS.
Wisconsin Association of Commercial Secretaries. Annual meeting. Secretary, D. A. Caldwell, Chamber of Commerce, Wausau, Wis.
JUNE 6-9.—ST. JOHN, N. B.
National Public Health Congress. Annual meeting. General Secretary, Dr. R. D. Defries, 206 Bloor Street, Toronto, Ont.
JUNE 6-10.—SWAMPSCOTT, MASS.
New England Association of Commercial Executives. Annual meeting. Secretary, Charles E. Smith, Chamber of Commerce, Woonsocket, R. I.
JUNE 13-17.—VICTORIA, B. C.
Canadian Good Roads Association. Annual convention. Secretary, George A. McNamee, 909 New Birks Building, Montreal, Quebec.
JUNE 20-23.—COLORADO SPRINGS, COLO.
National Association of Comptrollers and Accounting Officers. Annual convention. Secretary, Mark M. Foote, Comptroller's Office, Chicago, Ill.
JUNE 22-29.—PROVIDENCE, R. I.
National Conference of Social Work. Annual meeting. General Secretary, William H. Parker, 25 East 9th Street, Cincinnati, Ohio.
JUNE 26-JULY 1.—DETROIT, MICH.
American Library Association. Annual convention. Executive Secretary, Carl H. Milam, 78 East Washington Street, Chicago, Ill.
JULY 8-16.—LONDON, ENGLAND.
English Federation of Settlements. International Conference.
AUGUST 15-18.—SAN FRANCISCO, CALIF.
International Association of Fire Engineers. Annual meeting. James J. Mulcahey, City Hall, Yonkers, N. Y.
OCTOBER 9-13.—CLEVELAND, OHIO.
American Society for Municipal Improvements. Annual convention. Secretary, Charles Carroll Brown, P. O. Box 234, St. Petersburg, Fla.

HOLLOWSPUN

Lighting Standards

FOND DU LAC,
Wisconsin, has in-
stalled HOLLOW-
SPUN reinforced con-
crete lighting standards,
both for park lighting and
for business streets. Our
new catalog supplement
No. 9 contains full in-
formation on this and
other types of HOL-
LOWSPUN standards.

A copy will be sent on request.

**Massey Concrete
Products Corporation**

Peoples Gas Building, Chicago.



The Baldwin-Fairmount Filtration Plant and Pumping Station in Cleveland

Additions to Extensive Water-Works System Have Many Interesting Features

BEFORE the water-works was started and while Cleveland was still a small village, water was obtained from springs and wells. There were one or two good springs, but most of the water was hard, so that water for washing purposes was hauled up the hill from the river in barrels and wagons.

and one reservoir of 6,000,000 gallons capacity. In 1920 the distribution system had increased to 1,452 miles of pipe and four reservoirs with a combined capacity of about 157 million gallons. The average daily pumpage in 1857 was 348,700 gallons, and in 1920, 140,337,000 gallons.

The record shows that the number of



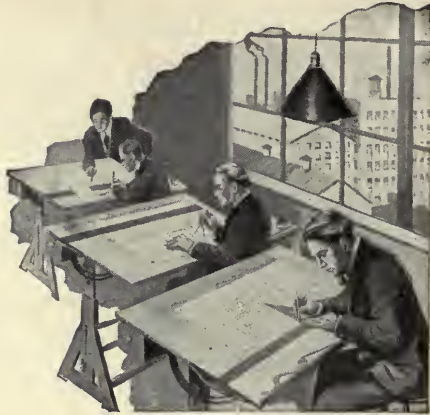
MODEL OF GROUNDS OF BALDWIN FILTRATION PLANT AND RESERVOIR, PREPARED FROM LANDSCAPE ARCHITECTS' PLANS

In 1854 work was started on the first pumping station, drawing its water from Lake Erie. In September, 1856, water was pumped into the mains, an event which was the cause of much jollification and celebration. The pumping equipment consisted of two Cornish beam engines and six boilers. The inlet was a pipe made of boiler plate 50 inches in diameter, extending 300 feet from shore and 400 feet west of the western terminus of the old river-bed and into 12 feet of water. The distribution system in 1857 consisted of 13 miles of water-main

connections, with meters in 1874 was 1.28 per cent of the total number of connections. This percentage gradually increased, until in 1901 it was 6.42 per cent. In 1902 the policy of metering all connections was inaugurated, so that by the end of the year 19.88 per cent of the services were metered. This policy was steadily followed, and in 1909 practically 100 per cent of the entire supply was measured through meters.

The New Facilities

The program for the future development



Expert Engineering Advice on all Playground Installations

The Medart Plan and Engineering Department is constantly adding to its 50 years of accumulated experience by devising and planning playgrounds so that the greatest good will follow through their use. Add to this an honest effort to plan every installation, no matter what its size, so that the maximum benefits are obtained at the minimum cost—and the result is a service which under no circumstances you can afford to be without.

No Cost or Obligation

Medart Engineering Service is given without cost or obligation of any kind whatever. It is a service of which you should avail yourself regardless of what your playground problem may be. Whether your plan is extensive or limited, you will always find it decidedly to your advantage to get the full benefit of our experience.



Send for Catalog L

Send for our Catalog L. It is perhaps one of the most complete treatises available and is recognized everywhere as a text book on modern playground planning. When you send for it please outline in brief just what your problem is—you will have our earnest and intelligent co-operation.

FRED MEDART MFG. CO.

Potomac and DeKalb Sts.
New York, 52 Vanderbilt Ave.

St. Louis, Mo.
San Francisco, Rialto Bldg.

Chicago, 326 W. Madison St.

MEDART

of the water-supply system to meet the growth of the city includes the construction of the new Fairmount pumping station and the new Baldwin filtration plant. The latter will utilize the present Fairmount reservoir as a receiving basin. The raw water will flow through the present East Side tunnel and will be forced by the pumps at the Kirtland Street station through two 60-inch cast iron pipe lines to the present reservoir at Fairmount. This reservoir consists of two basins with a combined capacity of 80,448,400 gallons. The water will then be pumped from the reservoir to the mixing station of the filter plant. A chemical house will be built over the raw water conduits, and as the water passes through the mixing flume the chemical solution will be applied. There will be four bins for the storage of chemicals, three of which hold 146 tons each, the other holding 71 tons. There will be six tanks for dissolving the chemical and four tanks for storing the chemical solution. Besides the storage bins for chemical in the chemical house, there will be six bins holding 175 tons each in the chemical storage house located on a railroad switch adjoining the Fairmount pumping station. The chemical storage house will be equipped with crushers, elevators, conveyors and unloaders for handling the chemicals as they are shipped in cars to the plant.

The mixing flume consists of a short expanding flume built on an incline with a fall of 3 feet in 20, causing the water to flow down the slope at a rate of 10 feet per second. The fast-flowing water strikes the pool with such force that there is produced what is technically known as the "hydraulic jump." It may be described as a miniature Niagara Falls, consisting of a foaming and seething torrent of water which passes through the flume, intimately mixing a com-

paratively small volume of chemical solution with a large volume of the water to be treated.

The mixed water enters the coagulation basin and is kept in a quiescent condition for a certain period by slow movement or passage through the basins. During the period in the settling or coagulation basins about 75 per cent of the suspended matter will be settled out of the water. The basins will be four in number, of 8,250,000 gallons each, of concrete with groined arch roof.

The administration building will be located in the center of the filter building. The first floor will consist of the offices of the superintendent, assistant superintendent, clerk and operators, and a room for visitors. The second floor will consist of the store-room, the machine shop and a large auditorium. The auditorium will be used in giving lectures on water purification and other educational features. The third floor will consist of drafting and record rooms, reference library, general chemical laboratory, water chemical laboratory, bacteriological, oil, coal and cement laboratory.

The clear water reservoir consists of two basins of reinforced concrete construction of the groined arch type. The storage capacity will be 130,000,000 gallons of water. This reservoir is now in process of construction.

The illustration on page 381 shows a model of the suggested landscape architectural treatment of the grounds of the new Fairmount filtration plant. This model was based on the recommendations of a group of Cleveland architects, engineers and landscape architects acting in concert for the benefit of the city. The model prepared from the plans is about 8 feet square and gives an excellent idea of the appearance of the grounds when completed.

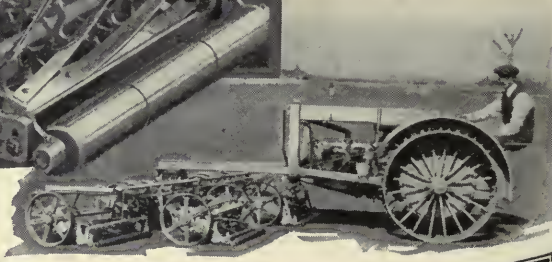
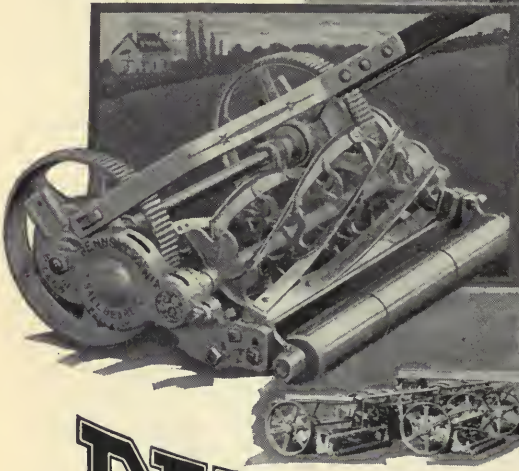
The Bates Experimental Road in Illinois

During the week of March 27, by means of a fleet of trucks, the Illinois Department of Public Works and Buildings, Division of Highways, began the loading of the Bates experimental road near Springfield, Ill. This test road was started in the summer of 1920 and completed early in 1921. It is about two miles in length and includes 63 sections. Each section differs from the others in thickness, in material, or in design affecting its carrying capacity. It is expected that as the loads carried by the

trucks are increased, many, if not all, of the sections will eventually be destroyed. The behavior of the various sections in supporting truck loads is expected to give valuable information in the way of confirming or disproving theories that have been advanced as to the load-supporting capacity of pavements of different types and thicknesses. This experiment is somewhat similar to the one being carried on by the United States Bureau of Public Roads in California.

Pennsylvania TRIO; a time and labor saver for golf course, parks, large estates 86 in. swath.

Pennsylvania GOLF; closest cutting for putting greens, tennis courts and fine lawns.



Five Pennsylvania Quality Mowers driven by tractor will cut 60 to 80 acres per day.

PENNSYLVANIA QUALITY LAWN MOWERS

DESIGNED for service, built for longest service and proven as giving greatest satisfaction in service, Pennsylvania *Quality* is the accepted standard of lawn mowers wherever large areas must be kept in perfect shape.

Write for "Pennsylvania TRIO Book"

Pennsylvania Lawn Mower Works, Inc.

1615 North 23rd Street, Philadelphia

The City Planning Commission as a Publicity Agent

By Lee R. Cooke

President, Idaho Chapter, American Association of Engineers

THE psychology of municipal politics, for some unknown reason, too often creates a feeling in the mind of the taxpayer that the men to whom he has entrusted the conduct of municipal affairs, once in office, can no longer be depended upon to consider the public welfare in the preparation of an improvement program, or even in the routine conduct of municipal affairs.

Western communities, at least, in which planning commissions exist, quite generally resent the restrictions which any city plan is bound to impose upon certain interests. These feelings, both of distrust and resentment, are born of a lack of knowledge of the aims and ideas underlying development plans, and the overcoming of opposition is quite largely a matter of education and direction of public sentiment.

A common practise requires the municipal authorities to refer any proposed municipal improvement program to the planning commission, for investigation and approval, provided it appeals to them as worthy of commendation. Where it is the custom of the planning commission to hold public discussions on such proposed plans, the custom can be made of benefit to both the municipal authorities and the commission, as well as to the public at large. Investigation by the commission, made without prejudice, will invariably bring out undeveloped phases of the proposed programs, and the hearings will serve the double purpose of offering a

means of publicity and of taking advantage of ideas which may be presented. Both regarding the improvement itself, and the conditions which will be created by the improvement, the hearing often offers the first opportunity of getting the point of view of the citizens at large.

The knowledge, brought out by these hearings, that the planning commission stands more or less as a representative of the public, tends to create a confidence in the work of their organization. Approval of a municipal improvement program by such a body of representative men goes a long way to create confidence in proposals of the municipal authorities which they are asking the public to support.

The city planning commission will invariably include within its personnel members of the various organizations of the community, and the individuals on the commission can do effective publicity work in quietly calling the attention of the organizations to which they belong, from time to time, to the plans which are being presented to the commission for their consideration and to the ideas which the commission, on its own initiative, is attempting to work out. City authorities that are overlooking the good which can be accomplished by a planning commission and the help which they can receive from such a commission are losing a big opportunity to lighten the numerous difficulties of municipal administration.

The Demand for Trained Administrators

Government is now playing a more important part in our daily life than at any other time in our national history. The functions of government are broader, the work of administration more complex. The success of government in performing the increasingly diversified services now required depends upon the extent to which the day-to-day work of government is entrusted to men and women trained in public administration.

As a nation, we are on the threshold of a new idea in government. The demand for "more business in government" and the spread of the city manager idea forecast the general recognition of the place of administration in government and the development of a new profession—the trained public administrator.

—National Institute of Public Administration.

16 Distinct Features of the Ideal Power Triplex Mower

A scientifically designed large power mower for mowing the large areas of grass in city parks

1—The Ideal Triplex is one compact unit comprising power plant and cutting units—15 minutes after you receive the machine you can start cutting grass, as there are no extra parts or attachments to be procured.

2—We build the Ideal Triplex complete in our own plant—it should in no way be confused with the type of assembled machines where some of the units were never intended for power mowing purposes.

3—We build our own cutting units—they are designed especially for this mower, having heavier blades and wheels and being equipped with Timken Bearings, which insures long and satisfactory service under high speed conditions.

4—Weight and traction are important factors on a power-driven mower. The Ideal Power Unit weighs but 1,600 pounds and the two traction wheels are each 12 inches wide.

5—The Ideal cuts clean and the extra traction eliminates any possibility of torn or mutilated turf; moreover, the outfit can be operated on very soft, spongy soil.

6—The Ideal can be successfully operated in many places where other types of power machines and horse-drawn mowers cannot possibly be used.

7—The Ideal has the most simple control of any large power mower built. The two control levers are conveniently placed at the right and left hand side of the operator so that with natural, easy movements the machine can be started, stopped, backed up and turned around in a very short radius.

8—Because of this simple control, operator can cut close to trees and shrubbery, leaving little or nothing for hand trimming.

9—Cutting Units are pushed ahead of the machine permitting the operator to see at all times exactly what he is doing; thus eliminating the danger of clogged blades being dragged over the turf. This insures clean work and grass is not packed down by the traction wheels.

10—Cutting Units are so suspended that they have sufficient flexibility to take care of any uneven spots in the turf.

11—The cutting units are easily elevated from the ground by means of a convenient lever, so located that operator does not have to move from seat.

12—The 4-cylinder power plant provides plenty of power for all conditions encountered and will negotiate steep grades without difficulty.

13—Alemite pressure lubricating system is provided throughout.

14—A roller can be attached and the grass cut and sod rolled in one operation. It can be used for general hauling about the grounds when required.

15—Most important is the fact that this Ideal Triplex is built by power mower experts and we are the oldest and largest builders of power lawn mowers in the world—oldest merely because we were the first to see the practical side of cutting grass by power—largest because the quality and design of our machines has sold more Ideal Power Mowers than all other makes combined.

16—Lastly, there is a nation-wide service back of this Ideal Triplex and the complete machine is fully guaranteed by one concern.

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R. E. Olds, Chairman

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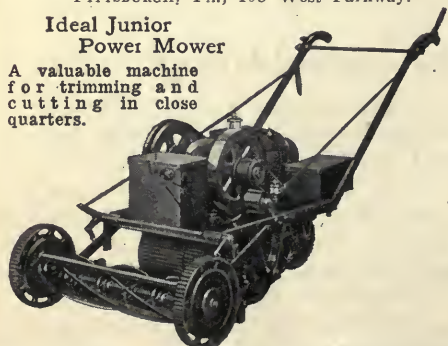
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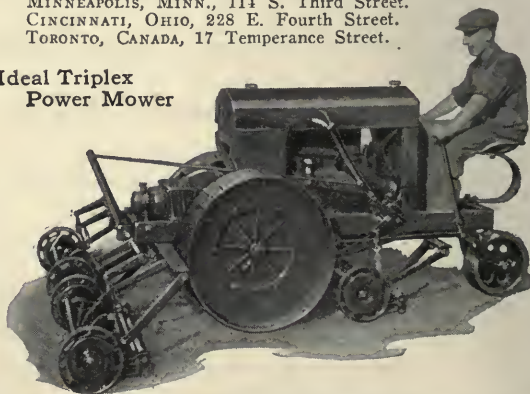
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Street Traffic Signaling

Railroad Signaling Adopted for City Streets

THERE are approximately ten million automobiles on the country roads and in the streets of the cities of the United States. The burden of this tremendous increase in vehicular traffic is chiefly felt in the cities where, in addition to the ever-present problem of keeping the streets as safe as possible, difficulties due to congestion make it a very serious problem.

Leaving out the feature of safety and dwelling entirely upon the problem of getting the traffic by certain points produces a problem analogous to that of railroad traffic. Signaling on railroads was first devised for the safeguarding of life and material. This function of signaling is to-day so widely recognized that present-day signaling is arranged not only to protect trains, but also to expedite their movement; in fact, were it not for signaling on railroads, it would be impossible for many busy lines to handle the traffic which they do to-day.

What signaling has done for railroads it can do also for towns and cities. As an example, we have Fifth Avenue in New York, where a signal indication is simultaneously given to twenty-six blocks of traffic, thereby allowing it to move in a steady stream within a certain limit of time. This method of giving priority to one direction of traffic, then stopping it and giving priority to the other direction, has resulted in a large increase in the number of vehicles which can pass the given points.

These early attempts at traffic signaling have naturally raised many questions as to the best practices to pursue, and it is safe to turn to the precedents set for us by the railroads wherever their principles can be applied to the control of traffic. Among the major principles which can be applied are:

1. The same indication for "Proceed," "Stop" or "Caution" should be used, irrespective of whether the direction is north, south, east or west, or whether the vehicle is going forward or backward.
2. Whenever a "Proceed" indication is given in one direction, "Stop" indications should be given on all conflicting routes to prevent accidents.
3. Signals should be clearly visible and

placed at fouling points, that is, at points beyond which it is unsafe to go.

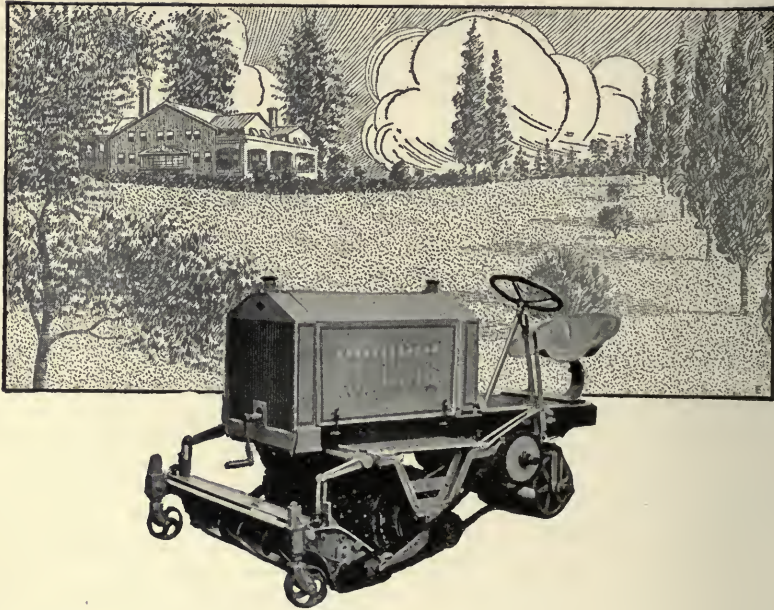
4. In case of failure of apparatus, the "Stop" indication should be given unless the operation of the signal is deliberately discontinued.

The foregoing can be applied to traffic signals with the exception that the location of the traffic signal is a very important matter. Obviously, the signals should not be placed so as to lessen the roadway available to traffic. The ideal location for a signal would be at the intersection of the centerlines of the crossing, but, as a rule, this is not desirable because of the necessity for overhead supports, wires, etc. The most practical location would appear to be at diagonal corners; two signals at diagonal corners of the intersection, with a signal suspended over the curb and visible from both streets. Such a signal would indicate in both directions and would be so constructed that it could not give a "Proceed" indication to both streets simultaneously.

Another feature which enters into any extensive street signaling system is the cost of operation. This cost includes not only the salary of the traffic official operating the system, but, in addition, the cost of electric power, if it is used, and the maintenance of the apparatus. Systems have been devised, automatic in their operation, which may cover as large an area of the municipality as is desired, and which are also capable, if desired, of taking the control of the signals at any location or locations away from the central point and of operating them individually by a traffic officer at those points.

Another element of cost, that is, the power consumption, should be reduced to a minimum by the use of efficient lenses which concentrate the light where required. It is desirable to have as few lamps as possible to control the intersections.

Street signaling will undoubtedly show a tremendous development within the next few years that will greatly reduce the number of accidents and the congestion, which not only is bad to-day, but bids fair to become worse from year to year without efficient control of traffic.



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○ F all the things that make a city park worth while, the lawns are not least important.

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Coldwell maintains a department for the effective solution of just such problems as yours, where those who wish to spend the wisest may rest their cares and be protected. Why not consult us?

COLDWELL LAWN MOWER CO.
NEWBURGH, N.Y., U.S.A.

It will interest you to know that —

Courses Are Offered in Public Administration

The National Institute of Public Administration at 261 Broadway, New York City, has announced its courses for the year 1922-23. The Institute was organized recently to carry on and extend the work of the Training School for Public Service of the New York Bureau of Municipal Research. In the last ten years over 450 students have received instruction here, many of whom have gone into positions with state and city governments. The courses cover the entire field of municipal administration.

Schools May Receive Help in Nature Study

The National Association of Audubon Societies has received \$30,000 which is to be used to aid teachers and pupils in the study of wild birds. Children will be taught to build bird boxes, feed birds in winter, to learn the names of common birds in their communities, and will be instructed in the value of birds to mankind. Teachers who form Junior Audubon Clubs may receive free material to aid in their work of teaching bird study. Already more than 1,700,000 children have been enrolled in these clubs in the schools of the United States and Canada, and the Association has on hand material to supply 200,000 more children during the next few months. Full information may be obtained by writing to T. Gilbert Pearson, President of the National Audubon Societies, 1974 Broadway, New York City.

Finger-Prints for Everybody Have Been Suggested

William J. Burns, Chief of the Bureau of Investigation of the Department of Justice, has suggested that finger-prints of everybody, young and old, be taken and filed for reference and identification. President Harding has filed his as a beginning of the collection. In certain South American cities the voluntary identification cards have been tried. It is understood that the system has

been very successful, even when not obligatory. Application for the cards was almost unanimous, because it was readily recognized that a person with nothing to conceal about his identity need not hesitate. The lack of a card, or the refusal to obtain one, as in the case of a stranger seeking employment, would raise a natural suspicion.

Voting Machines Are Obligatory for New York State Cities

Governor Miller has signed the bill which makes obligatory the use of voting machines in all the cities of New York State. While many cities have been using them for years, their use in the cities of this state has been optional.

Drastic Penalties Check Paris Motor Accidents

The Prefect of the Police of Paris has given orders that in the future any motor vehicle which runs down a pedestrian or is responsible for a serious collision shall be seized and put under seal. If the driver is found guilty, he is imprisoned and the car is sold; if acquitted, he regains his car. The plan is said to be very effective in reducing the number of street accidents.

Milwaukee Has Created the Office of City Real Estate Agent

Under the provisions of a law passed last year by the state of Wisconsin, the city of Milwaukee has created the office of Real Estate Agent. A portion of the ordinance defining the office is quoted herewith:

"There is hereby created the position of Real Estate Agent of the City Council and the Public Land Commission, said agent to be appointed by the Public Land Commission by a majority vote to perform such duties in relation to the purchase, sale and exchange of real estate and negotiations leading up to and concluding such transactions in real estate, its appraisal, acquisition, purchase, transfer and sale which such city may acquire, purchase, dispose of, transfer or sell for its use or the use of its departments, bureaus or any part of said city or to be used for streets, in excess condemnation, or as playgrounds, squares or any other purpose of said city, and any and all acts and duties in connection with said real estate which may be required of said Board of Public Land Commissioners, or its assistants by the Common Council of said city, or by its Public Land Commission."

America's Par-Excellent Power Lawn Mower

When you purchase a power lawn mower, look to its mechanical features as you do in buying an automobile. This is particularly true in park and cemetery work, where it requires sturdy qualities to meet the long, hard grind.

The 4-Acre Power Mower is built with the mechanical perfection and accuracy of a fine automobile, the sturdiness of a tractor, yet extremely simple.

Here Are A Few Of Its Outstanding Mechanical Advantages

Motor—1 h. p. 2 cycle, 3 port, 2½" bore by 2½" stroke, sight-feed oiler, specially designed for mower work, air-cooled, speed 2½ to 3½ miles per hour; few parts and requires little attention.

Transmission—cut gears, enclosed, running in oil bath replenished once a year. Separate control on reel and traction wheels. No exposed parts to catch shrubbery.

Control entirely from steering handle. Miniature differential eliminates twisting and hauling. Easy to cut close to trees, flower beds, fences, etc. Will cut on 30° incline.

Automatic Release on Reel prevents breakage of knives, and reel may be sharpened without removing, thru specially provided reverse gears.

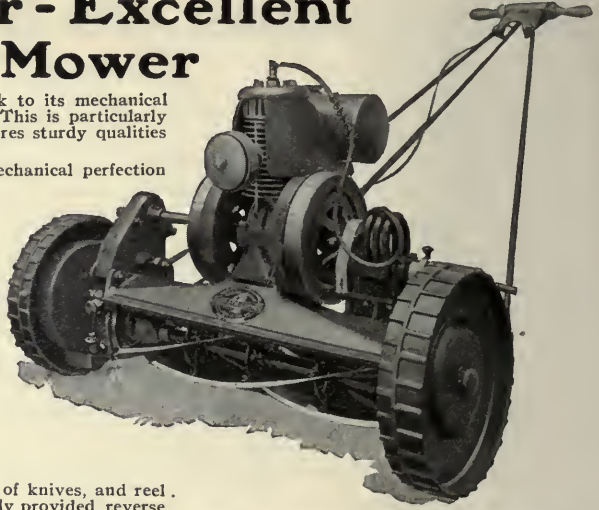
Capacity—width of cut 24 inches. Cuts 4 to 5 acres a day at fuel cost of less than 40 cents a day. Occupies only 18x35-inch floor storage space.

Cooling System. Fan blades in fly wheels force continuous draft over motor.

Shipping Weight. 250 pounds. The weight, evenly balanced over rear roller, provides adequate rolling without stunting the grass. Patents pending.

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For information address

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One Madison Avenue, New York

Until January 1st, 1922, Messrs. Hill and Marts were Managing Partners in the firm of Ward, Hill, Pierce and Wells, nationally recognized as the originators and leaders in the field of raising finances by organized volunteer community effort. They retired from this firm to organize the Hotel Financing Company. Their entrance into the hotel field puts the very best experience and ability at the command of Chambers of Commerce and other community organizations planning new hotels.

Public Works Programs and Engineers' Salaries

Salaries Must Measure Up to Service Throughout the Country

THE situation which has existed throughout the Middle West and to a lesser degree in other parts of the country for the past year has amounted to a veritable persecution of public works programs and the engineering profession.

During the war the farmer was receiving extremely satisfactory prices, and for a time afterwards prices were good. There was plenty of money in the country and it was easy to borrow. The market for fine cars and expensive farm machinery was large. Then came the land boom. Farms changed hands over and over, some of them the same day, each change involving an increment in the price. Then the price of farm products broke, dropping sharply, crossed the production line and kept falling. Money not only became tight, but could not be secured. Notes fell due and had to be renewed. This condition was not new. Old-timers have lived through it over and over. It was a cause for grave concern, but not for panic, nor did it bring one on.

The reactionary element is always with us, even in the most prosperous times. It fights the building of schools, the installation of water and light systems and the development of adequate highways. This group was quick to take advantage of the mental condition of the public. The leaders went up and down the land preaching havoc and calamity. Meetings were held in many counties throughout the Middle West. Some of these were gatherings of a dignified nature for the thoughtful consideration of public affairs. Others were conclaves of carefully shepherded malcontents. Sets of resolutions were adopted. These were aimed at the road programs, but also included other public activities, such as the schools and the public health nurse. Petitions were circulated asking the authorities to stop all public work, disperse with engineers, cut the school appropriations to the bone, and so on.

The public works engineer found himself

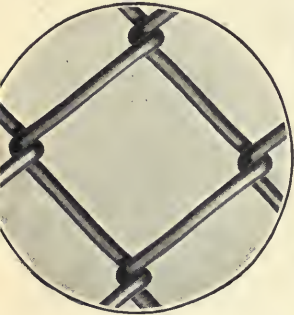
in an unenviable situation because of these conditions. Attention was focused in many instances on the iniquitous salary he was receiving. The fact that a year or two ago he was drawing the same salary and riding in the same old Ford in attending to his business, while the state at large was selling corn at a dollar-eighty and buying expensive automobiles, was never mentioned.

When one considers what the engineer has done for cities, counties and entire states throughout the length and breadth of this country, due acknowledgment must be rendered to him. The drainage engineer made half of the Middle West and Western States, the highway engineer is giving them a modern system of highways, and yet in many cases he is considered a pensioner. The county engineer and his force are, in the thought of the public, too often classed with the inmates of the poor farm as dependents of the county, although they are rendering a sincere, invaluable public service.

The reliable engineer is a trained technical man, competent, faithful and giving his best service. It is inexpedient to cut his salary. The loss of the services of a trained county engineer or state highway engineer who knows his county or state like a book is disastrous to the continuity of public work. It takes one or two years for an engineer to thoroughly learn the needs of his county or state. Few engineers can afford slashed salaries or poor remuneration for the sake of the honor in the work. They will be attracted elsewhere by higher salaries and work which will give them a fair living. Several state highway departments have already lost their chief engineers through penurious budgets which made it impossible to pay salaries commensurate with the services of the men. In many instances, entire county highway organizations have been wrecked because the small salaries which the taxpayers would permit could not hold the men from more advantageous positions elsewhere.

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Section of Page-Protection Fence showing actual size of wire used.

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Page-Protection Fence always gives satisfaction. It has the rugged strength to resist its most formidable foes—wind, weather and trespasser.

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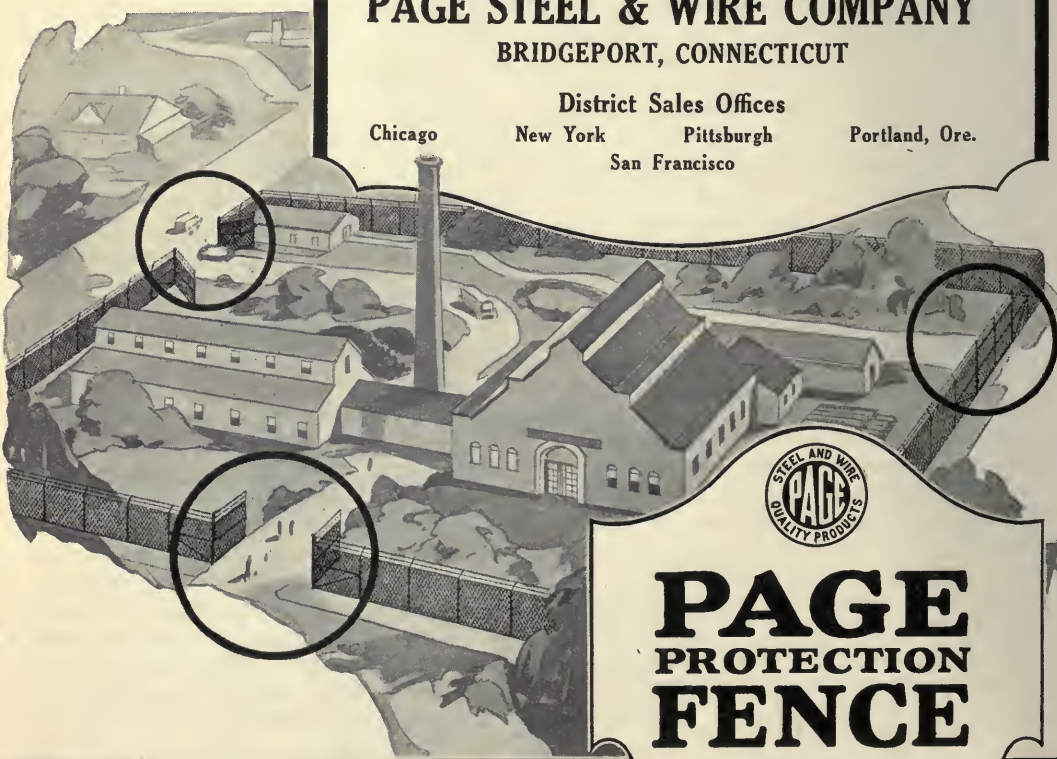
Page-Protection Fence is also made of rust resisting Armco Ingot Iron (99.84% pure.)

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PAGE PROTECTION FENCE

The City's Legal Rights and Duties

Information for City Attorneys and Other Municipal Officers, Summarizing
Important Court Decisions and Legislation

Conducted by A. L. H. Street, Attorney at Law

Under Ordinance, City May Lawfully Tax Professional Men Who Maintain Office in City

The California District Court of Appeals finds no invalidity or inconsistency in a city's being authorized to levy an occupation tax on the right of an attorney or other professional man to pursue his vocation within the city limits, although the state may have issued a license establishing his general right to practice in the state.

In the case of Waldo S. Johnson, 190 Pacific Reporter, 852, he unsuccessfully contested the validity of an ordinance of the city of Maysville, Calif., imposing a tax of \$2.50 per month on "every person engaged in business as a lawyer, maintaining an office in said city." The Court remarked:

"The chief claim of the petitioner is that the city has no power to license the business of a lawyer. It is pointed out that a lawyer is licensed as such by the courts, that his license is in the nature of a vested right, and that any act of the Legislature curtailing this right would impair the obligation of a contract. Without conceding that these claims are well founded, they are, nevertheless, inapplicable to the case. It is true that a license cannot be imposed upon a lawyer, nor can his business be regulated by ordinance. But the petitioner is not charged with practicing law without a license, but with 'carrying on a trade, calling, profession, or business' without first procuring a license. Sections 1 and 4 of the ordinance, when read in connection with section 80, above quoted, show clearly that the license is exacted for 'carrying on the business of a lawyer at a fixed place of business.' The propriety of exacting revenue from one who maintains an office and carries on a business within a city is apparent. Many expenditures by the city are rendered necessary by reason of an office or other place of business within its limits. . . . There appears to be no inherent difference between carrying on the business of practicing law and carrying on any other business or pursuit. It is not questioned that the state may, in the exercise of its sovereign powers, levy license taxes upon merchants and manufacturers who maintain places of business, and this, too, for the sole purpose of raising revenue. A lawyer's office makes certain demands upon the various fire,

police, street, and other functions of a city, which differ from above classes only in quantity, and not in quality. If the one should be required to assist in keeping up the revenues of a city, no reason is apparent why the other should not. Whether a license might be enacted for carrying on a law business without maintaining an office is a question that is not before the court. We entertain no doubt that a state license issued to a lawyer authorizing him to practice law is not a bar to the claim of city to levy a license for maintaining an office in connection with such practice. For many years the state has licensed druggists, but it has not been suggested that a druggist's license is the equivalent of a license to run a drug store."

Motor-Cycle Policemen Not Subject to Speed Regulations in Attempting to Overtake Speeders, But Must Use Care

A decision of the Minnesota Supreme Court illustrates the modern tendency of the courts to regard the spirit of a law, rather than its wording, in applying its provisions. (*Edberg v. Johnson*, 184 Northwestern Reporter, 12.)

Defendant, a Duluth motor-cycle policeman, was sued for damages for colliding with plaintiff, a pedestrian, while attempting to overtake a motorist who was violating the speed limit fixed by the Minnesota Motor Vehicle Act.

Plaintiff sought to charge defendant with negligence conclusively on the ground that he himself was driving his motor-cycle faster than permitted by the Act. It was conceded that the statute expressly exempted "police patrol wagons" from the speed limit, but denied that a motor-cycle could be deemed to be a "patrol wagon." It was argued that by limiting the exception of vehicles from the act to patrol wagons, ambulances, fire wagons, etc., the Legislature excluded motor-cycles. Disposing of these contentions, the Supreme Court said:

"In *Hubert v. Granzow*, 131 Minn. 361, 155 N. W. 204, Ann. Cas. 1917D, 563, this Court held that, as a general rule, regulations governing the rate of speed on public streets do not apply to fire apparatus on the way to a fire.



Two men handling a 48-inch diameter "ACME" (Nestable) Corrugated Culvert. Imagine the convenience in handling large culverts in this manner.

*Large diameters
easy to handle*

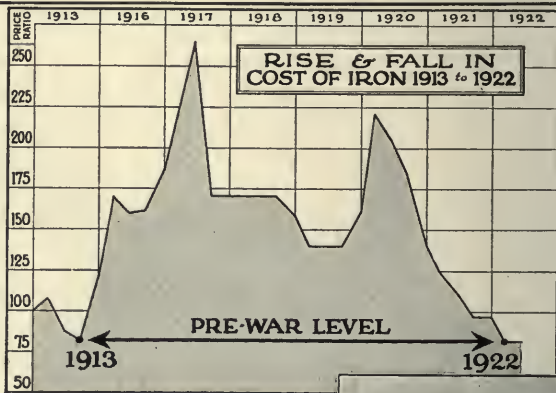
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The same reasons apply with equal force to vehicles used by police officers. An officer so engaged is performing a public duty. He cannot successfully perform it unless he is accorded privileges not possessed by private citizens. He would be seriously hampered if statutory provisions limiting the speed of motor vehicles applied to him while in pursuit of a fleeing criminal. For reasons of public policy, at least one court has felt free to hold that such provisions have no application even though the statute contained no exceptions in favor of peace officers. *State v. Gorham*, 110 Wash. 330, 188 Pac. 457, 9 A. L. R. 365. In another jurisdiction, a contrary view was expressed. *Keevil v. Ponsford* (Tex. Civ. App.) 173 S. W. 518. And in still another it was held that in case of military necessity a statute limiting the speed of motor vehicles should be held inapplicable.

"The statute is not worded as explicitly as it might have been to express the intent the Legislature undoubtedly had in mind. Strictly speaking, a motor-cycle operated by a policeman patrolling the streets is not a police patrol wagon. If the letter of the statute rather than its spirit is to control in its interpretation, the municipal court was right and the district court was wrong. The applicable rules of construction are too well known to justify more than a mere reference to them. The intent of the Legislature controls, though it seems contrary to the letter of the statute, and a construction should be avoided which would result in inconvenience or absurdity.

"To secure the safety of the public is one of the principal objects of the statute. A criminal, seeking to get away from the scene of his crime, commonly travels in an automobile driven at a high rate of speed. There are reckless drivers of automobiles, who pay no attention to the speed laws. Both classes of offenders must be overtaken by the officers of the law, if they are to be placed under arrest. As an aid to officers on patrol duty, no vehicle more serviceable than the motor-cycle has as yet been invented. Of course it is possible for such officers to use automobiles, instead of motor-cycles; but their use would be equally if not more dangerous to others if driven at a high rate of speed.

"Whether the words 'police patrol wagons,' as used in this statute, include motor-cycles, may be open to argument.

"Taking into consideration the objects sought to be attained by the statute, the general use of motor-cycles in patrolling streets and highways when the statute was enacted, as well as at the present time, and the evident purpose of the Legislature to except from the operation of the statute vehicles employed as instrumentalities of municipal fire and police departments, we hold that motor-cycles so employed come within the exceptions made by the statute.

"We do not hold that an officer, when in pursuit of a lawbreaker, is under no obligation to exercise a reasonable degree of care to avoid injury to others who may be on the public roads and streets. What we do hold is that, when so

engaged, he is not to be deemed negligent merely because he fails to observe the requirements of the Motor Vehicle Act. His conduct is to be examined and tested by another standard. He is required to observe the care which a reasonably prudent man would exercise in the discharge of official duties of a like nature under like circumstances."

City Operating Public Utility Is Liable for Assault by Superintendent Upon a Patron

Finding that defendant city's superintendent of its water-works department committed an inexcusable assault upon an inoffensive Jewish patron who called to pay his bill, the North Carolina Supreme Court decided that the city must respond in damages, the same as a private water-works corporation would be bound to do under similar circumstances. (*Munick v. Durham*, 106 South-eastern Reporter, 665.)

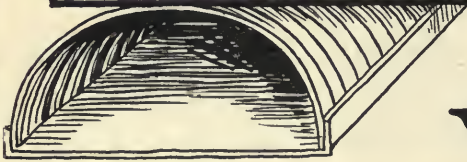
When plaintiff presented 50 pennies in part payment of his bill, the superintendent knocked them on the floor, calling plaintiff a "—— Jew." This abuse was followed by a beating, to which plaintiff offered neither provocation nor resistance.

Suit brought by plaintiff against the city to recover damages was ordered dismissed by the trial court, on the ground that the city could not be held responsible for the superintendent's wrongful act. But this decision was reversed by the Supreme Court, which says, in part:

"There is no explanation of the conduct of the superintendent, and the only provocation given which we can infer from the language used by Bolton is the fact that the plaintiff was a Jew. He made no other charge.

"The ground upon which the nonsuit was asked and allowed, as presented in this court, is that the defendants and the city of Durham are not responsible for the act of its agent, Harvey Bolton, superintendent of the water-works, or that at least in making the assault he was not within the scope of his authority, in that he had no instructions from the defendants to commit such violence. At the time that the assault was made by the said Harvey Bolton he was acting in his capacity as agent. Had he been acting for a water company under private ownership, it could not be contended that the corporation would not be responsible. He was there in the prosecution and furtherance of the duties assigned to him by the defendant municipality."

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these culverts are installed to carry small streams and drainage under roads, preventing the washing away of the foundation, or of the road surface. Thousands of feet of these culverts, made of Genuine Open Hearth Iron (99.875 PURE IRON COPPER ALLOY) have been sold with no other exterior protection than a coat of asphalt rubber paint. Newport culverts are the most rust-resisting and strongest culverts on the market today. They are guaranteed to last longer under identical conditions than any other corrugated metal culvert pipes. They are made in full-round and half-round types, as illustrated, so that city, county or state officials may have a culvert adaptable to every condition.

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542 West Tenth Street, Newport, Kentucky

Where There Is No Occasion for Its Further Public Use, Property Owned by City May Be Sold

Upholding the validity of a sale and conveyance by a city to a private manufacturing company of a portion of a court-house site that had never been used for that or any other public purpose, the Virginia Supreme Court of Appeals said in the recent case of *Head-Lipscomb-McCormick Co. v. City of Bristol*, 105 *Southeastern Reporter*, 500:

"While at common law a municipal corporation could, unless restrained by its charter, dispose of its lands and other property just as private individuals could, in this country it is generally held that a municipal corporation has no implied power to sell property which is devoted to a public use, but property of which the public use has ceased, or which has never been devoted to any public use, may be sold by the municipality owing it, by virtue of its implied power."

Discharge of Sewage in Stream Is an Actionable Nuisance

Where a municipal corporation discharges sewage into a river or creek, polluting the water of the stream, causing it to become foul, and impregnated with noxious and poisonous substances, rendering it unfit for domestic or other uses, and thereby creating and maintaining a nuisance, which is detrimental to the health, comfort, and repose of a lower riparian owner, and diminishes the value of his land, such municipal corporation is liable for damages arising from the maintenance of such nuisance. (*Oklahoma Supreme Court, City of Cushing vs. Luke*, 199 *Pacific Reporter*, 578.)

Under Its Charter, City of Savannah Held to Have Power to Classify and Separately Tax Certain Business Pursuits

The mayor and aldermen of Savannah, under the city's charter, have authority to make a reasonable classification of the general business of selling automobiles, selling or furnishing gasoline, or oil of any kind, etc., and to levy a tax on each of such classes. And where such a tax is levied, and one person conducts several of such businesses, he may be made liable to a tax on each, although one branch of the business may be conducted in a building, and the other on the sidewalk in front of the same building. (*Georgia Supreme Court, Lewis vs. Mayor and Aldermen of City of Savannah*, 107 *Southeastern Reporter*, 588.)

Premature Proceedings Contesting the Validity of a Zoning Ordinance Dismissed

A proceeding in the courts to review the validity of a zoning ordinance, on application by a property owner who claims that the marketability of his land is injuriously affected will be dismissed as being premature, in the absence of a showing that he has been prevented from erecting any building intended for a prohibited use. The proper procedure is to apply for mandamus to require issue of a building permit or to resist conviction of violating the ordinance on the ground of its invalidity. (*New Jersey Court of Errors and Appeals, Cliffside Park Realty Co. vs. Borough of Cliffside Park*, 114 *Atlantic Reporter*, 797.)

Municipality Liable for Damages Resulting from Creating a Nuisance by Permitting Overflow on Private Property

In the course of improving a highway the authorities of the village of Southampton, Long Island, removed sand from dunes on a shore in such way that ocean water was permitted to penetrate through the cut made and overflow plaintiff's lawn, thereby destroying grass, trees, shrubs, etc.

Plaintiff sued the village authorities to recover damages, and the Appellate Division of the New York Supreme Court upholds the right of recovery. (*Davies v. Jagger*, 188 *New York Supplement*, 789), saying:

"The trial court has correctly held that the present action may be maintained on the authority of *Carll v. Village of Northport*, 11 *App. Div.* 120, 122, 42 *N. Y. Supp.* 576. That the appellant, although a municipal corporation, is not immune from legal responsibility for the creation of a nuisance, is beyond question. *Herman v. City of Buffalo*, 214 *N. Y.* 316, 318, 108 *N. E.* 451. The theory upon which the present action is brought is nuisance. Respondent does not claim damages by reason of a change in grade of the highway, but rather because of defendant's act in causing a cut or opening to be made in the sand dunes, whereby salt water was permitted to run over and upon her land. It is true that the sand taken from the dunes was used to raise the grade of certain highways, although it also appears that a stone wall was constructed across Halsey's Neck lane to stop-gap the openings made in the sand dunes at that point, with the object in view of preventing the salt water from undermining the road. But it does not appear that any similar precaution was taken or a barrier erected in the place where the openings were made at the foot of Cooper's Neck Lane, through which the water came which destroyed plaintiff's plants and shrubbery."

GOODYEAR YEAR



Goodyear All-Weather Tread Solid Tire

Copyright 1922, by The Goodyear Tire & Rubber Co., Inc.

When conditions of load or road call for a solid tire, think of Goodyear All-Weather Tread Solids.

They wear longer because they are thicker and their tough, gripping tread blocks prevent spinning and constant slippage.

They remain resilient and springy, protecting engine and chassis from road shocks and jars. Fuel, repairs and time are saved by Goodyear All-Weather Tread Solid Tires.

There are Goodyear All-Weather Tread Solids in sizes ranging from 34x5 to 40x14.

For lighter and quicker hauling under different conditions Goodyear makes other special tires—Goodyear Cord Truck Tires and Goodyear Cushion Tires.

The nearest Goodyear dealer or Goodyear branch will assist you in equipping with the correct tires for your needs.



Single Jacket Underwriters Fire Hose

The Underwriters label on Goodyear Single Jacket Fire Hose and Goodyear Monterey Chemical Hose, means that both will withstand a definite pressure per square inch and that the latter will resist satisfactorily the biting, corrosive action of chemicals. Goodyear's years of successful manufacturing experience has enabled the production of hose on a par with all other Goodyear products—hose which will render dependable and economical service.



Monterey Chemical Hose

Municipal and Civic Publications

Prices do not include postage unless so stated

HANDBOOK OF MUNICIPAL GOVERNMENT

Charles M. Fassett, Specialist in Municipal Government, University of Kansas; former Mayor of Spokane, Wash. Thomas Y. Crowell Company, New York, 1922. VIII + 192 pp. \$1.50.

This book covers concisely the entire field of municipal government. Starting with the ancient city, it traces modern institutions to their present forms. Among the subjects discussed in detail are forms of government, charters and home rule, elections and appointments, the duties of administrative officers and their departments. The closing chapters are on municipal finance and the obligations of citizenship. The author's long experience with municipal problems enables him to handle his subjects in a direct, practical way. The volume includes a bibliography prepared by the Research Division of the American City Bureau.

ASSETS OF THE IDEAL CITY

Charles M. Fassett, Thomas Y. Crowell Company, New York, 1922. XV + 177 pp. \$1.50

A clear, condensed summary of the various elements of modern municipal life. There are brief discussions of municipal government, with chapters on streets, utilities, transportation, health, recreation, educational and correctional institutions, and other subjects. The book is well adapted for use as a text-book for schools or citizenship classes. There is a foreword by Harold S. Battenheim, editor of *The American City*.

MOTION PICTURES FOR COMMUNITY NEEDS

Gladys and Henry Bollman. Henry Holt and Company, New York, 1922. IX + 298 pp. Illustrated. \$2.00 postpaid.

Both of the authors have long been associated with the educational film business, and are thoroughly acquainted with the subject. The book is practical, giving the development of the educational film pictures, a discussion of the exhibitor's problems, many suggested programs for various types of audience, and a large amount of technical, mechanical and legal information.

HISTORY OF PUBLIC POOR RELIEF IN MASSACHUSETTS—1620-1920

Robert W. Kelso, A.B., LL.B., President of the National Conference of Social Work. Houghton Mifflin Company, Boston, 1922. 200 pp. \$2.50.

A comprehensive account of poor relief in Massachusetts, tracing back to origins in England and in colonial history. The concluding chapters describe the absorption of relief by the state, and the development of the Massachusetts Department of Public Welfare, with special attention to the Child Care and Child Placing System of the state.

PUBLIC OPINION

Walter Lippmann. Harcourt, Brace and Company, New York, 1922. 427 pp. \$2.75.

This book is the first attempt to survey in the light of modern conditions the force of public opinion. It is not a moralistic judgment, but an investigation of such things as the principles of censorship, propaganda, publicity, electioneering, and news. It is the outgrowth of ten years' study and experience in newspaper work, politics, and war service.

NEW ERA CIVICS

John B. Howe, Litt. D. Iroquois Publishing Company, Inc., Syracuse, N. Y. 1922. X + 420 pp. Illustrated.

A textbook for school use. It is divided into five parts, Citizenship, The Nation, The State, The Local Community, and The Parties. At the end of each chapter are suggested questions for teachers.

HYDRAULICS OF PIPE LINES

W. F. Darand, Professor of Mechanical Engineering, Stanford University, California. D. Van Nostrand Company, New York, 1921. XVI + 271 pp. 134 illustrations. Price \$4.50.

This book gives in a reasonably small space a valuable discussion of the more important hydraulic problems connected with water and oil pipe lines and pipe line flow. The treatise is almost entirely from the flow standpoint. The six chapters cover elementary principles, surge, water ram or shock, stresses, materials, joints, fittings, etc., and a discussion of oil pipe lines or those intended for the carrying of other viscous fluids.

THE MODERN CITY AND ITS GOVERNMENT

William Parr Capes, Secretary, New York State Conference of Mayors and Other City Officials; Director, New York State Bureau of Municipal Information. E. P. Dutton & Company, New York, 1922. XI + 269 pp. Charts and diagrams. \$5.

A thoroughgoing consideration of the fundamentals of good municipal government. The duties both of the official and of the citizen that chooses the official are discussed. There are chapters on the common forms of municipal government—the federal type, the commission type, and the commission manager form. The chapter on the control and management of city school systems is timely. The concluding chapter is on "The Future Cost of City Government," showing the author's belief that unless the people want the activities of municipal government curtailed, there will be no material decreases in the cost of municipal government.

NEW IDEALS IN THE PLANNING OF CITIES, TOWNS AND VILLAGES

John Nolen, Town and City Planner. The American City Bureau, Tribune Building, New York. 139 pp. Illustrated. \$1.00.

Originally prepared as a textbook, this volume presents a comprehensive survey of town and city planning. It gives an outline of the local data needed as a basis of the city plan, the elements of the plan, and the methods of putting it into effect.

CITY PLANNING IN CHICAGO

"South Water Street Facts—Why the Improvement Should Go Forward Without Delay." Published by the Chicago City Plan Commission. 1922. 11 pp. Illustrated. Discussion of the urgency of the double-decked thoroughfares proposed for South Water Street. (Apply to Chicago City Plan Commission, Hotel Sherman, Chicago, Ill.).

TEXAS WATER-SUPPLIES

"Water Supply for Texas—Keeping It Pure," by Wilson T. Davidson, M. D., Director of Public Health, Dallas, Tex. Reprinted from *Texas Municipalities*, of January, 1922. 6 pp. Illustrated. (Apply to author, address above.)

NORTH DAKOTA ENGINEERS

"Proceedings of the North Dakota Society of Engineers, Twelfth and Thirteenth Annual Meetings. 1921. 91 pp. 75 cents. (Apply to E. F. Chandler, Secretary-Treasurer, University, North Dakota.)

MOTOR BUS LINES

"Fundamentals in the Operation of Motor Bus Lines," by G. A. Green, General Manager, Fifth Avenue Coach Company, New York, N. Y. Published by the National Motor Truck Committee, National Automobile Chamber of Commerce, 366 Madison Avenue, New York, N. Y. 7 pp. (Apply to publishers.)

DRUG ADDICTION

"Narcotic Drug Addiction," speech of the Hon. Lester D. Volk of New York in the House of Representatives, January 13, 1922. 16 pp. (Apply to author, Washington, D. C.)

NATIONAL CONFERENCE OF SOCIAL WORK

Proceedings of the National Conference of Social Work at the Forty-eighth Annual Session, held in Wisconsin, June, 1921. Published by the University of Chicago Press, Chicago, Ill. (Apply to William H. Parker, General Secretary of the Conference, 315 Plymouth Court, Chicago, Ill.)

MUNICIPAL EMPLOYEES' ANNUITY AND BENEFIT FUND

"An Act Relating to Municipal Employees' Annuity and Benefit Fund, Chicago," with explanatory statement and accompanying tables. 1921. 130 pp. Covers the act in force in Chicago since July 1, 1921. (Apply to The Municipal Employees' Annuity and Benefit Fund, Room 1005, City Hall, Chicago, Ill.)

STATE PARKS

"State Parks," by Harold A. Caparn, landscape architect, New York. 17 pp. Illustrated. Descriptions of state parks in the United States. Published as a Supplement to the *National Municipal Review*, November, 1921. (Apply to the National Municipal League, 261 Broadway, New York, N. Y.)



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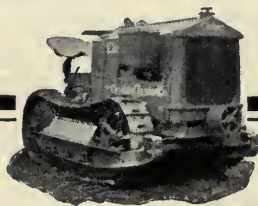
Cleveland, Ohio



HARD THIS WAY, BUT—



EASY ON A TRACK THE CLETRAC WAY



EXPANSION AND CONTRACTION OF CONCRETE

"A Study of the Effect of Moisture upon the Expansion and Contraction of Plain and Reinforced Concrete," by Torata Matsumoto. Published as Bulletin No. 126, Engineering Experiment Station, University of Illinois: 1921. 37 pp. Illustrated. 20 cents. (Apply to the Engineering Experiment Station, University of Illinois, Urbana, Ill.)

NEW JERSEY ROADS

Paper on Roads, presented by C. E. F. Hetrick, Mayor, Asbury Park, before the North Jersey Shore League of Municipalities. Illustrated. (Apply to author.)

NEW YORK STATE HEALTH DEPARTMENT

"Work and Aims of Health Department," by F. D. Beagle, Executive Clerk, State Department of Health, Albany, N. Y. Reprinted from the January-February, 1922, State Service Magazine. 7 pp. (Apply to author, address above.)

TESTS FOR PURE WATER

"The Reactions of Culture Media," by George C. Bunker, Physiologist to The Panama Canal, and Henry Schubert, Chemist and Bacteriologist at Miraflores Purification Plant. Reprinted from the Journal of the American Water Works Association, January, 1922. 53 pp. Illustrated. Gives the results of the authors' experience in determining the hydrogen-ion concentration of some of the commonly used media by means of color standards. (Apply to George C. Bunker, Physiologist to The Panama Canal, Ancon, Canal Zone.)

CITY PLANNING IN THE UNITED STATES

"A Review of City Planning in the United States, 1920-21," by Theodora Kimball, Librarian, School of Landscape Architecture, Harvard University. Enlarged from article in National Municipal Review, January, 1922. (Apply to author, Cambridge, Mass.)

THE POLICE POWER AND CITY PLANNING

"Enforcing an Official City Plan for Streets as a Police Power Regulation." Published by the National Conference on City Planning, as Bulletin No. 2, Series 1922. Contains the decision in the case of Town of Windsor, Conn., vs. Henry D. Whitney et al., that under a proper statute an official plan may be adopted which private development must follow, for which interference there is no compensation. (Apply to Flavel Shurtleff, Secretary, National Conference on City Planning, 60 State Street, Boston, Mass.)

CONDUCTING A MILK CAMPAIGN

"How to Have a Successful Milk Campaign," by the Departments of Agricultural Journalism and Home Economics of the University of Wisconsin. Published by the Extension Service of the College of Agriculture, University of Wisconsin, Madison, Wis., as Circular No. 140, December, 1921. 32 pp. Illustrated. (Apply to publishers.)

SURVEY OF ST. LOUIS, MO.

"St. Louis Social and Religious Survey," conducted by the Church Federation of St. Louis, Mo., 1922. An 8-page folder. (Apply to The Committee on Social and Religious Surveys, 111 Fifth Ave., New York, N. Y.)

SAFETY INSTRUCTION IN SCHOOLS

"Safety Education," a report read to the Cincinnati Principals' Association, January, 1921, by F. E. Reszke, Principal Whittier School, Cincinnati, Ohio. 10 pp. (Apply to author, address above.)

THE EVOLUTION OF THE U. S. PUBLIC HEALTH SERVICE

"The United States Public Health Service: Its Evolution and Organization. Reprint No. 661 from the Public Health Reports, May 27, 1921. Published by the United States Public Health Service, Treasury Department, Washington, D. C. (Apply to publishers.)

NEW ROCHELLE, N. Y., ZONING ORDINANCE

Zoning Ordinance of the city of New Rochelle, N. Y. 16 pp. Map. (Apply to Jere Milleman, Chairman of Board of Appeals on Zoning, 31 Faneuil Place, New Rochelle, N. Y.)

THE RESOURCES OF THE SOUTHERN STATES

"Blue Book of Southern Progress," published by the Manufacturers Record, Baltimore, Md. 1922. 72 pp. 50 cents. A brief industrial history of the South, with statistical statements of the existing and potential resources of the region. (Apply to publishers, address above.)

FINANCES OF SCOTT COUNTY, IOWA

Financial Report of Scott County, Iowa, for the year 1920. Compiled by the County Auditor. (Apply to Joseph Wagner, County Auditor, Davenport, Iowa.)

PROTECTION OF STATE FORESTS

Forest Warden's Manual, by W. Darrow Clark, Chief Forest Fire Warden of North Carolina. Published by the Forestry Division, North Carolina Geological and Economic Survey. 1922. 23 pp. (Apply to author, Chapel Hill, N. C.)

WATER PUBLICATION

For copies of "Water Purification in Iowa," listed in The American City for March, 1922, apply to Jack J. Hinman, Jr., State University of Iowa, Iowa City, Iowa.)

THE CHICAGO PUBLIC SCHOOLS

"Suggestions for Studying the Chicago Public Schools," prepared by the Board of Education for the convenience of the members of the National Education Association attending the meeting of the Department of Superintendence. 1922. 40 pp. Illustrated. (Apply to Louis F. Wilk, Secretary, Board of Education, Chicago, Ill.)

Municipal Reports

Baltimore, Md.—The Ordinance of Estimates for the year 1922, with detailed statements of the appropriations for the maintenance of the government of the city of Baltimore. (Apply to Peter E. Tome, City Comptroller, Baltimore, Md.)

Bellingham, Wash.—City Comptroller's Annual Report. 1920. (Apply to Charles A. McLennan, City Comptroller, Bellingham, Wash.)

Boston, Mass.—Annual Report of the Assessing Department for the year 1920. (Apply to Frederick H. Temple, Secretary, Assessors of the City of Boston, City Hall Annex, Boston, Mass.)

Chicago, Ill.—Twenty-fourth Annual Report of the Department of Gas and Electricity, 1920. (Apply to William G. Keith, Commissioner of Gas and Electricity, Chicago, Ill.)

Clarksburg, W. Va.—Semi-annual Report for the six months ending December 31, 1921. (Apply to Harrison G. Otis, City Manager.)

Dayton, Ohio.—Annual Report of the Division of Health, Department of Public Welfare, for the year 1921. (Apply to A. O. Peters, M. D., Commissioner of Health.)

Erie, Pa.—Fifty-fourth Annual Report of the Commissioners of Water-works, for the year ending December 31, 1920. (Apply to James S. Dunwoody, Superintendent of Water-works.)

Greeley, Colo.—Annual Report of the Water Department for the year ending December 31, 1921. (Apply to Milton Seaman, Superintendent of Water, Greeley, Colo.)

Jackson, Miss.—Quarterly Financial Statements for the quarters ending September 30, 1921, and December 31, 1921. (Apply to A. W. Tobias, City Auditor.)

Kalamazoo, Mich.—Budget for the year 1922, as en-

acted by the City Commission, December 30, 1921. (Apply to Harry H. Freeman, City Manager.)

Kalispell, Mont.—Eighth Annual Report of the Water Department for the year ending December 31, 1921. (Apply to W. H. Lawrence, Superintendent of Water Department.)

Los Angeles, Calif.—Eleventh and Twelfth Annual Reports of the Board of Public Utilities, for the years ending June 30, 1920, and June 30, 1921, respectively. (Apply to Robert E. Wirsching, President Board of Public Utilities.)

Los Angeles, Calif.—Report of the Auditor for the fiscal year ended June 30, 1921. (Apply to John S. Myers, City Auditor.)

New York, N. Y.—Report of the Commissioner of Taxes and Assessments for the year ending March 31, 1921. (Apply to C. Rockland Tyng, Secretary, Commission of Taxes and Assessments, New York, N. Y.)

Palo Alto, Calif.—Annual Report of the Health Department for the year ending December 31, 1921. (Apply to Louis Olsen, Health Officer.)

Saginaw, Mich.—Annual Report of the Department of Light, Water and Sewers for 1921. (Apply to R. F. Johnson, Commissioner of Light, Water and Sewers.)

St. Louis, Mo.—Annual Report of the Board of Commissioners of Tower Grove Park, for the year ending December 31, 1921. (Apply to C. E. Hutchings, Secretary, Commissioners of Tower Grove Park, St. Louis, Mo.)

Wilmington, Del.—Fifty-second Report of the Board of Water Commissioners, for the fiscal year 1920-21. (Apply to James I. Ford, President, Board of Water Commissioners.)

Winston-Salem, N. C.—Annual Report of the Department of Health for the year ending December 31, 1921. (Apply to R. L. Carlton, M. D., Health Officer.)

CUT STREET CLEANING COSTS SQUARELY IN HALF!



The AUTOSWEEPER

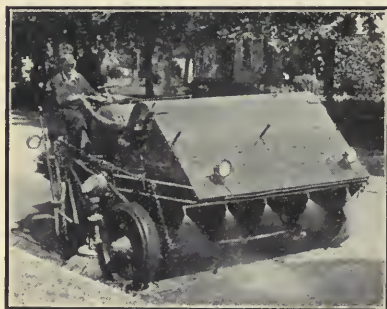
The Auto Sweeper for Streets

Works at *twice* the speed of horse-drawn sweepers. One AUTOSWEEPER does the work of *two* horse-drawn sweepers.

Sprays the street and sweeps it.

Placed near center of street, it is unequalled as a "feeder" to a pick-up sweeper.

Circular No. A-44 tells all about the AUTO-SWEEPER.



The ELGIN

A Pick-Up Sweeper

A sentence from a sample letter:—

"We have made 50% saving in street cleaning since introducing the ELGIN, Aug. 20, 1918." Name on request.

You'll find "*The Eventual Method*" in The ELGIN: the machine that sprays the street, cleans the gutter, sweeps 10 ft. of pavement, collects the refuse and carts it away.

163 owners have 284 Elgin machines.

Circular No. A-48 describes The ELGIN.



The
AUTO-EDUCTOR

Catch Basins Cleaned Quickly

During last September, Chicago's 7 AUTO-EDUCTORS cleaned 2,809 catch basins at \$1.90 each.

In the same month, Chicago cleaned 1,165 catch basins by hand. These cost \$4.41 each.

The AUTO-EDUCTOR *saved* \$2.51 per catch basin.

Without alteration, and with little additional equipment, the AUTO-EDUCTOR becomes a flusher, sprinkler, tree-sprayer, snow plow, ordinary truck, etc. Can be used 365 days a year, both day and night.

Circular No. A-50 tells how.

THE ELGIN LINE COMPRISES AMERICA'S LEADERS

ELGIN SALES CORPORATION

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Old Colony Building,
CHICAGO

Methods, Materials and Appliances

News for City and County Engineers, City Managers, Water-Works Superintendents, City Controllers, Park Superintendents, Purchasing Agents, and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

Garbage Handling in Akron

The Division of Waste, Akron, Ohio, has adapted a 15-ton motor tractor to the task of hauling garbage between the city and the stock-feeding farm, 9 miles distant. At the start the engineers thought of using horses, but were practically unanimous in their belief that this would be both expensive and inefficient, so motor trucks were considered. The engineers felt that the purchase of a sufficient number of motor trucks to handle the work would require too large an initial outlay. Furthermore, in house-to-house collection, they realized that horse-drawn units would be much more economical than large motor trucks.

The system as finally organized made use of a 15-ton Mack tractor, made by the International Motor Company, 25 Broadway, New York City, to draw three trailers, each with a capacity of three tons. Each trailer was to be hauled from house to house by horses for the collection of garbage, and then, fully loaded, to be covered with tarpaulin and taken to a central point where they would be formed into a train drawn to the piggery by the tractors. After a few trips it was found that the tractor could handle

more than three trailers without excessive strain. Consequently, other trailers were added, and soon the tractor was hauling six trailers on each trip.

The trip from the city to the stock-feeding farm consists of nine miles of well-paved but hilly road with a number of long, steep grades, one with an incline of approximately 9 per cent. The tractor hauled the six trailers on this trip in one hour and forty minutes. The trailers are of the side-dump type with drop frame, which can be unloaded at the piggery in a very short time. The tractor does not carry a load of garbage, but sufficient traction is obtained by a number of weights equal to about two tons. W. C. Rawson is Superintendent of Garbage Disposal, and B. J. Hill, Purchasing Agent for the city of Akron.

New Pumping Engine for Newport, Ky.

The Ahrens-Fox Fire Engine Company, Cincinnati, Ohio, recently received a contract for a 1,300-gallon auto pumping engine and for a tractor to be attached to an aerial ladder truck for Newport, Ky.



A TRAILER TRAIN ON ITS WAY TO THE AKRON GARBAGE FARM



Tractors for power, speed, economy

Preparing streets for repaving, breaking up old pavements, making new thoroughfares, all require an abundance of steady, dependable power.

Scarifiers, plows, drills, levelers, scrapers, graders, etc., do their best work, and more of it, when propelled by good tractors. This is because the tractor has the reserve power to keep the tool moving constantly at proper speeds and with proper adjustments for maximum results.

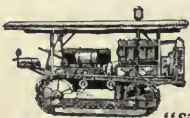
Tractors like the BEST concentrate the pulling power of a large number of animals within a small unit which is easy to manage, easy to maneuver, and which has none of the weaknesses of the flesh.

Best Tractors are famous for stamina, power and dependability, and their cost for up-keep and operation is small. That is why they are being adopted more and more by municipal, county and state officials for road and street making and maintenance.

Let us send you further details on the use of tractors for road and street work. Write for catalogs, prices and names of our nearest dealers.

C. L. BEST TRACTOR CO.
SAN LEANDRO - CALIFORNIA

There are three models of Best Tractors—the "Sixty," the "Thirty" and the "Cruiser" (60). All are factory-built—not assembled.



"Sixty"



"Thirty"



"Cruiser"



A ONE-MAN MOTOR MOWER FOR PARKS

A Small Motor Mower of Large Capacity

To combine the extreme flexibility of the hand lawn-mower with the large cutting capacity, rolling feature and other advantages and conveniences of the motor mower, the Coldwell Lawn Mower Company, Newburgh, N. Y., has brought out the new Coldwell Model L motor mower and roller, which cuts a 25-inch swath. This mower is adapted particularly for large lawns, parks, cemeteries and public grounds and for fine cutting on tennis courts and bowling greens. It is equipped with a Fuller & Johnson motor and is claimed to fill the need for a practical motor-driven hand-controlled lawn-mower with plenty of reserve power which will make it possible to cut close up to and around trees, shrubbery, walks and driveways, to operate efficiently on the smaller areas, and at the same time to be able to cut four to six acres per day on the larger areas of lawn. The cutting knives, which are positively controlled and operated by power transmitted directly from the motor independently of the drive roller, are an integral part of the machine and have been designed and tested for their special function under power.

Safe Steps for Public Buildings

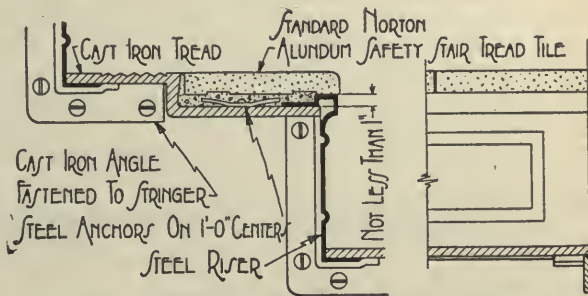
Many municipal officials have had their troubles in getting steps that are safe for the public without sacrificing attractiveness and economy. In the Girls' Trade School at Worcester, Mass., a \$350,000 building, the architects have made every step slip-proof and at the same time practically wear-proof, thus eliminating maintenance costs. In accomplishing this end, Alundum safety tile, made by the Norton Company, Worcester, Mass., has been used in combination with iron and steel.

In laying standard Norton Alundum safety stair tread tile, a bed of mortar well anchored by steel anchors and composed of one part Port-

land cement and two parts clean, sharp sand, not less than 1 inch in thickness, is applied over a special cast iron tread depressed to receive the tile. The tile is then soaked in clean water, and before setting into place is drained only long enough to allow the water to disappear from the surface. With a mortar composed of one part Portland cement and one part clean, sharp, fine sifted sand, mixed to a consistency usually allowed for ordinary lime mortar, the entire bottom surface of the tile is then scantily buttered. The edges of the tile are also buttered with the same mortar. Then the tile is laid true to line on the bed with a shoved joint of about 1/4-inch. Excess mortar is trimmed off with a trowel, and the tile tamped to a level surface, care being taken not to smudge the surface of the tile. As soon as the mortar has properly set, the joints are rubbed and all cement cleaned from the surface of the tile with a soft abrasive brick or a piece of sandstone and water. Immediately after the cleansing of the tile, it is thoroughly rinsed with a strong stream of water, and is kept sprinkled for a period of from two to six days.

New Cast Iron Pipe Office

The United States Cast Iron Pipe & Foundry Company, Burlington, N. J., has announced the opening of a new office at the Interstate Building, Kansas City, Mo., in charge of D. W. Pratt, Sales Agent.



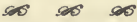
WORKING SKETCH FOR LAYING SAFETY TREAD ON STAIRS



Why Road Builders Prefer Kentucky Rock Asphalt

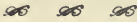
Contractors and engineers who have laid or supervised Kentucky Rock Asphalt pavements prefer it to other hard surface types. The reason for this is evident when the advantages of this natural asphalt mix is understood and verified by experience.

Kentucky Rock Asphalt is ready mixed and ready to lay cold on any base adequate to carry the traffic. It is shipped in open top cars and may be unloaded and handled by machinery at a considerable saving. Kentucky Rock Asphalt is not susceptible to damage from the weather. The material may be ordered in at any time and stored in the open at convenient sites along the work, thereby eliminating costly delays.



No expensive equipment is required in Kentucky Rock Asphalt construction. Shovels, rakes and a roller are all the equipment needed. There is no need of skilled or expert asphalt workmen.

Kentucky Rock Asphalt requires no special binder course on curb. The material is spread cold on the base; raked to proper depth and rolled. The pavement may be thrown open to traffic immediately.



Kentucky Rock Asphalt has eliminated the risk of surface failures or replacements. Every contractor knows that in laying the more common types of asphalts, he constantly faces the risk due to human error in mixing, heating or laying. Kentucky Rock Asphalt is uniform, by laboratory test. Exposure to the elements, even for a period of years, does not affect it. Laid on a base

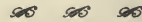
sufficient for the traffic, it always gives maximum results.

Foundation replacement is not difficult even after the surface has been laid. The rock asphalt may be cut away and, after the base has been repaired, the asphalt may be broken up and used again in restoring the surface.

Surface irregularities may be corrected without disturbing the pavement. If a slight depression occurs in the finished job, the surface may be roughened and brought to proper grade by adding rock asphalt. The patch, after a few days' traffic, will bond so perfectly that it may not be detected.

The finished Kentucky Rock Asphalt surface is equal in every respect and in many ways superior to sheet asphalt. It is smooth, noiseless, dustless and resilient. Kentucky Rock Asphalt pavements do not crack, roll, buckle or bleed even under the most severe traffic and climatic conditions.

Kentucky Rock Asphalt has been recognized in the standard specifications of ten states. It has been approved for Federal aid on such heavy traffic roads as the Dixie, Jackson and Lincoln Highways and the National Road.



If you are a contractor, anxious to get away from costly equipment and many uncertainties of road and street construction, or if you are an engineer eager to serve your community by building the best pavement at a reasonable cost, it will pay you to investigate Kentucky Rock Asphalt. Write for Booklet D

Kentucky Rock Asphalt Company

INCORPORATED

711-718 Marion E. Taylor Building

LOUISVILLE, KENTUCKY

No Concrete House Connections in Baltimore

On page 17 of the January, 1922, issue of *THE AMERICAN CITY*, there appeared a plan showing the Baltimore method of placing double house connections for sewers under a sidewalk, in the article, "The Laying of Concrete Pipe Sewers." We are in receipt of a letter from A. E. Christhif, Highways Engineer, Sewer Division, Baltimore, Md., stating that he feels that this caption may lead our readers to the inference that concrete pipe is being used for house sewers in Baltimore. No concrete pipe has ever been used in Baltimore for sanitary sewers. There are, however, some storm-water drains carrying only non-polluted waste that have been built of concrete pipe ranging in size from 24 to 48 inches.

How to Travel to the I. A. F. E. Convention

Fire engineers, fire chiefs and others who expect to attend the annual convention of the International Association of Fire Engineers in San Francisco, August 9-18, should secure a copy of the itinerary which has been prepared by F. E. Bensen, Eureka Fire Hose Department, U. S. Rubber Company, 27 Barclay Street, New York City. This itinerary covers the complete trip from New York, starting August 5, to the convention and return. As reservations are being made in the order of receipt, those who would like to go on this interesting trip should communicate with Mr. Bensen at once.

A Meter Box for Southern Cities

The "Crescent" meter box illustrated herewith has been developed by the Ford Meter Box Company, 406 South Carroll Street, Wabash, Ind., particularly for Southern cities. Exhaustive studies were made of the requirements of the Sewerage and Water Board of New Orleans, La., and this meter box was worked out to fit conditions. The box is complete and entirely self-contained, having within its base a stop and waste cock, an expansion coupling, and a test valve on the outlet side of the meter, all made of high-grade bronze. In comparing the cost of installing this meter box with that of installing any other type, it is well to keep in mind that with it the usual curb stop, curb box, meter connections and test valve are eliminated. The meter may be easily installed or removed without the use of tools, joints being made by compression only. Bronze inlet and outlet parts are tapped regularly for $\frac{3}{4}$ -inch iron pipe, but solder nipples may be used.

Where it may be desired to continue in use a standard curb stop, already installed, a bronze adapter may be substituted for the stop and waste valve as regularly furnished. The main body of the box is of cast iron, made into inner and outer shells, threaded so that the depth of the box may be adjusted to suit service lines from 12 to 18 inches deep. The top of the box is thus easily kept at grade.



A DISSECTED METER BOX

The top of the "Crescent" meter box is made in two regular styles—loose, as illustrated, and locking. The loose lids are provided with deep webs, so that they cannot be jarred out of the cover top. They may be lifted out by means of a hand tool, which is supplied with the box. The locking lid is simple and is operated by a key, which becomes a lifting handle when the lid is unlocked. The keyhole is unobstructed, so that any dirt falling into it will pass straight through and not jam the lock. At present, this meter box is made for standard $\frac{5}{8}$ -inch meters only, having meter spuds of $1 \frac{1}{16}$ inches external diameter.

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WE know from reliable records that Tiffin Street Flushers do **MORE WORK** and **BETTER WORK** at a lower **OPERATING EXPENSE** than any other street flushers.

We ask the opportunity of proving these claims to you. Because we have been able to prove them to others, there are, today, more Tiffin Flushers in successful operation than any other make.

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*Builders of Tiffin Motor Trucks (specializing in Municipal types), also
Tiffin Dump Wagons, Sanitary Carts, etc., etc.*

FLUSHERS

Drinking Fountains for Outdoor Use

Municipal authorities have learned by severe financial losses and bitter experiences that it is ruinous to install fountains designed for indoor use alone along streets, in parks, playgrounds and other open places. They are not usually built strong enough to withstand public wear and tear. Most such fountains must be turned off at the approach of cold weather, and yet there are many pleasant days in the late fall and early spring when drinking water in public places is highly desirable.

The Murdock Manufacturing and Supply Company, Cincinnati, Ohio, makes an anti-freezing drinking fountain designed for all-year service. This fountain does not need to be turned off at the approach of winter, nor does it have to be dismantled or boxed up, as it is built to stand the usual wear and tear on public drinking fountains, with the exception of unusual accidents and malicious abuse. While all working parts of this fountain are buried in the ground below the reach of frost, they are reasonably accessible without digging up the main fixture. Removing the pedal and two small bolts permits all working parts, including the valves, to be lifted out. Thus when re-washing or packing is required, it is only a few moments' work to make the shift.

The accompanying illustration shows an anti-freezing fountain with a memorial feature. This was erected in Lytle Park, Cincinnati, by Dr. Merrill Ricketts in memory of his son, who was killed with the Marines in France. The reverse side of the granite rock has a tablet imbedded in it with the names of all Cincinnati Marines who made the supreme sacrifice in France. This furnishes a memorial which performs a real service to the public.



A MEMORIAL FOUNTAIN IN CINCINNATI

A Mechanical Greased Pig

A new piece of playground apparatus that challenges the physical abilities of almost any red-blooded American youngster is shown in the accompanying illustration. This barrel-of-fun is a sort of greased pig affair which has proved quite popular in the Southern States and has been developed by the Hill-Standard Company, Anderson, Ind., for general playground use.

The barrel runs freely in the center of a horizontal pipe axle two feet above the ground. This axle, ten feet in length, extends from the center of the barrel head and is supported at the extreme ends by uprights which are imbedded in concrete. Being made entirely of pressed steel, the barrel offers little chance for injury, is weather-proof and always ready for use. Many feats of skill may be performed upon this, such as balancing with the body in all conceivable positions, diving over, somersaults, treadmill, and a number of other stunts.

Elgin Moves Chicago Office

The Elgin Sales Corporation has announced that on March 31 it moved its Chicago office to 10 South La Salle Street, Chicago, Ill.

This company handles the sales of Elgin Auto-sweepers and pick-up sweepers for street cleaning and Auto-Eductors for removing filth from catch-basins.



IT TAKES AN AGILE YOUNGSTER TO STICK TO THIS

TRINIDAD in Chicago



Madison Street, near Wabash, Chicago. Resurfaced with Trinidad Sheet Asphalt in 1912. No maintenance cost to date.

Where quality remains —price is forgotten

Twenty-five years and more of service—under terrific pounding of traffic—is the record of Trinidad Lake Asphalt Streets in all parts of the world.

And it's this wonderful endurance—AN ABSOLUTE PROOF OF QUALITY—that makes Trinidad the lowest-cost paving material on the market.

Many Trinidad paved streets have resisted traffic and the elements for OVER THIRTY YEARS, at a maintenance cost of less than a cent per yard per year. Think of it! No other bituminous material has even approached this record.

Trinidad Lake Asphalt is a NATIVE bitumen—a product created by nature and storm-beaten and sun-cured in the tropics for ages. Neither torrid heat nor arctic cold affect its binding and wear-resisting properties.

Noiseless—long-lasting—low maintenance—resilient—attractive. These are the reasons Trinidad Lake Asphalt is "The Standard Paving Material of the World."

Before paving new streets or repaving old ones, let us send you illustrated folders describing this remarkable nature-made product.

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St. Louis
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Atlanta
San Francisco



The Genasco Line includes asphaltic roofing, flooring, paints and allied products. Write for descriptive matter.

TRINIDAD LAKE ASPHALT

New Central Fire Alarm Office for Shreveport, La.

At a regular meeting of the Commissioners of the city of Shreveport, La., on February 28, the bid of the Gamewell Fire Alarm Telegraph Company, Newton Upper Falls, Mass., for a new central fire alarm office to be installed in the new central fire station was accepted, including 50 new fire alarm boxes. C. F. Maulen, of the Gamewell Fire Alarm Company's Dallas office, spoke at length on the need of additional boxes and offered to install another 50 boxes, making 100 in all, at a comparatively small additional cost. The latter proposition will be voted on at the next meeting.

A cardboard map was shown the members of the Commission, on which were various colored pins indicating the old boxes in red and the 50 new locations in green. This demonstration convinced the Commission that another 50 boxes will be needed shortly. The Commission also accepted the bid of the Gamewell Company on a 27-box-and-flashlight police system. With the 100 new fire alarm boxes and the 27 new police boxes and flashlights the city will be much better protected. It is felt that a number of mistakes made in telephoning alarms to the central office will be eliminated, thus making quicker action possible.

Another fire station is to be added at the corner of Line and Wilkinson Streets in the heart of the new residential district. The plans and specifications were drawn so that a handsome building will be erected, to cost about \$35,000. The new central fire station will be located at the corner of Crockett and Common Streets, will have five doors, a machine shop in the rear, and an entrance on Common Street. The fire alarm office will be on the second story, fire-proof in every respect, and will be furnished with Art Metal furniture. There will be an 80-foot drill tower, with provisions for drying hose, and for a large fire bell. The fire bell will be used only on second and third alarms. This information was furnished THE AMERICAN CITY through the courtesy of S. J. Flores, Acting Chief, Shreveport, La., Fire Department.

Steel Paving-Guards for Roadways

It is a well-known fact that almost any type of paving will ravel at the edges unless properly protected. It will fray because of lack of stability of the shoulder material. This in turn permits the road to lose its correct cross-section. Frost also causes fraying at the edges, and inadequate drainage and heavy and fast-moving traffic break down the edges of brick, concrete and bituminous roads, which are usually held in place only by earth or a cinder shoulder compacted by a steam roller.

When traffic was light and slow, this problem was not particularly important. With the increase of traffic, rubble stones were placed



PAVING-GUARD ALONG EDGE OF A HEAVY-TRUCKING THOROUGHFARE IN SOUTH-WEST PHILADELPHIA

along the side, and later dressed granite blocks and concrete were used as runners or headers. But with the present heavy truck traffic none of these hold up unless supported by some type of steel paving-guard such as that made by the W. S. Godwin Company, of Baltimore, Md. This steel-armored edge bonds with the paving and forms a permanent protection against raveling.

New Parks for Petersburg, Va.

Petersburg, Va., has initiated a park program to develop some of the well-known Civil War sites surrounding the city. George Burnap, park and town planner, of Washington, D. C., has been engaged to prepare plans for the various portions of this system. One of the first units to be developed is the tract of 450 acres in which remain many of the Civil War entrenchments in a good state of preservation. This area is to be dedicated to the memory of General Lee. East View Park, an attractive piece of land, on the edge of a congested district, is to be remodeled as a community center. Plans have been completed and work is under construction for a nine-hole golf course on the grounds of the new country club, which adjoin the Lee Memorial Park area and form a continuation of the park land of that vicinity.



Why Bridgeport is Unpopular with Crooks

TEN Harley-Davidson police motorcycles are scooting about Bridgeport, Conn., today—catching speeders, curbing reckless drivers and traffic law violators.

In addition to paying the city a profit on this work, the Harley-Davidsons give the citizens a lot of extra police protection without cost to the taxpayers. The very fact that mounted officers are liable to be here, there and everywhere makes the city unhealthy for crooks and they look elsewhere.

Over 800 American police and sheriff departments are finding the Harley-Davidson a real money-maker. It soon pays for itself and then earns the department a good profit by the additional "business" it brings in. And its durability and economy (average, 50 miles for a dollar—gas, oil, tires and all) are famous.

HARLEY-DAVIDSON MOTOR CO.
MILWAUKEE WISCONSIN

Ask your local dealer for free demonstration of the 1922 Harley-Davidson and the reduced prices. Write us for illustrated literature which shows how several American cities use police motorcycles. No obligation to you.

Harley-Davidson

World's Champion Motorcycle



MEDIUM-WEIGHT TRACTORS HANDLING FRESNOS IN GRADING

Tractors for City Parks and Golf Courses

There are about 2,500 golf courses, including both municipal and private courses, in the United States, and every city of any size has at least one park which is kept mowed and attractive. An interesting case of the use of medium-weight tractors in the construction of golf courses is found at the Canterbury Golf Club, of Cleveland, Ohio. In the construction of this course not a single team of horses was used, but seven "Cletracs," made by the Cleveland Tractor Company, Cleveland, furnished the tractive power for all the work—pulling scrapers, graders, ditchers, plows, etc., hauling materials, excavating for traps, throwing up bunkers, leveling off putting greens and tees, and plowing and fitting the grass seed beds for the fairways. The contractor in charge of this work has been using Cletracs for three years in various parts of the country and has frequently used as many as 90 teams of horses on a single course. He has found that one tractor will replace five teams of horses throughout the year.

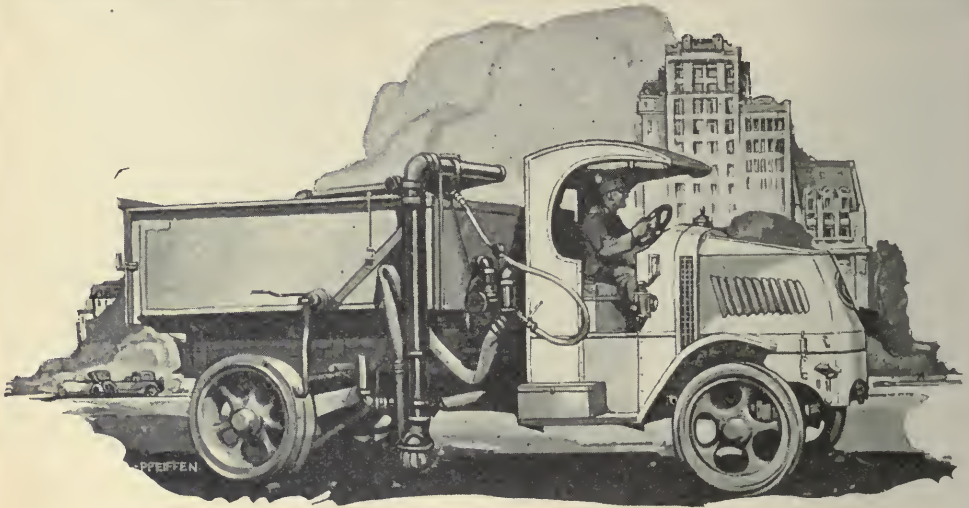
The Inverness Club of Toledo, Ohio, has a 160-acre course, on which horses were used almost exclusively until a Cletrac was purchased, which mows the fairways and the rough, and handles all the haulage and repair work. The tractor used is equipped with smooth tracks that do not injure the turf, and pulls a battery of seven 30-inch roller lawn mowers on the fairways, cutting a 16-foot swath and mowing the 160-acre course in two days. A special field mower attachment on the tractor is used for mowing the rough. The low-set construction of the tractor and its large tractive surface enable it to work on steep grades and hillsides without danger of slipping or tipping. The 12-horse-power draw-bar capacity and short turning radius have made it possible to use the machine for hauling wood, coal, gravel, cinders, building material, etc., and for doing repairing and rebuilding work on the course. Many cities are using Cletracs in park work.

Membrane Waterproofing for Large Reservoir

An interesting test of waterproofing membrane was conducted recently on one of the largest water basins in the South, the Kilpatrick Hill Reservoir at Nashville, Tenn. After a layer of gunite had been shot on the reservoir walls, the waterproofing materials were applied over a small section surrounded by a wooden frame. Over this was applied another layer of gunite concrete. From this section of waterproofing and concrete a heavy weight was suspended, but it failed to displace the waterproofing materials, although the gunite on the walls above the framework cracked slightly under the strain.

The details of the method of conducting the test were as follows: First, the section of the reservoir wall was selected and gunite sprayed over the surface. After the concrete had set, a frame 12 x 12 x 3 inches was braced against the wall, and inside of this the waterproofing membrane was formed, as follows: first, a layer of Genasco priming paint was applied, then alternate layers of Genasco positive seal asphalt B and positive seal burlap were placed, four of the former and three of the latter forming the complete membrane. On top of this membrane manufactured by the Barber Asphalt Company, Land Title Building, Philadelphia, Pa., a slab of gunite averaging 40 pounds to the square foot was sprayed and allowed to harden for four days. A swinging platform was then rigged, one end of the supporting bar being suspended from the box points and the other from uprights. The points of suspension were five feet apart, and a load of six sacks of cement, weighing 576 pounds, was placed at a point one foot from the block. This arrangement gave a direct downward pull of 460.8 pounds against the waterproofing fabric, but despite this test the membrane held fast.

The waterproofing of the big reservoir was carried out by Stewart Brothers Hardware Company, of Memphis, Tenn.



Special Equipment for Catch-Basin Cleaning

THE Otterson Auto-Eductor is effecting marked savings of time and money in many municipalities today. This apparatus is mounted on a 5-ton Mack chassis and consists of a large steel tank, powerful centrifugal pump, hose, connections, etc. It is operated entirely by the truck engine, and constitutes the most efficient outfit made for cleaning catch-basins or corner inlets.

The efficiency of the whole apparatus—truck and eductor—makes possible an immediate saving of from 25% to

75% in the cost of doing such work by obsolete methods. The distinct combination of advantages in the apparatus is its flexibility, its speed of operation, coupled with the low operating cost and long life of the Mack chassis. Specifications will be sent upon request.

Our latest "Municipal Equipment Bulletin" contains detailed descriptions of the most comprehensive line of municipal transport apparatus available today.

You should have a copy. Simply drop us a post-card requesting it.



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Capacities: 1½ to 7½ tons



Tractors to 15 tons

"PERFORMANCE COUNTS"

Alvord, Burdick & Howson

Announcement has been made that the firm of Alvord & Burdick will hereafter be known as Alvord, Burdick & Howson, 8 South Dearborn Street, Chicago, Ill. Louis R. Howson, whose name is now identified with the firm, has been a member of the organization for the past fifteen years as assistant, principal assistant, and partner.

George L. Watson Moves Offices

Colonel George L. Watson, C. E., has moved his office from 16 West 41st Street to 150 Nassau Street, New York City, at which latter address he will continue his consulting engineering practice. Colonel Watson's experience covers a wide field in mining, tunnel, bridge, harbor improvement, pipe line and sewer work in the United States, and extensive diversified experience in connection with the Engineering Corps of the English troops and the A. E. F. in Europe. He is a member of the Board of Consulting Engineers of the New York State Bridge and Tunnel Commission and the New Jersey Interstate Bridge and Tunnel Commission.

In his new office, incorporated with those of the George A. Johnson Company, Consulting

Engineers, Colonel Watson, in addition to serving his personal clientele, will collaborate in the engineering work of the George A. Johnson Company.

Annual Meeting of Manufacturers of Water Purifying Equipment

At the annual meeting of the Associated Manufacturers of Water Purification Equipment, George M. Hodkinson, American Water Softener Company, Philadelphia, Pa., was elected President, W. E. Titus, Refinite Company, Omaha, Nebr., Vice-President, and F. B. Leopold, Pittsburgh Filter Manufacturing Company, Pittsburgh, Pa., Secretary and Treasurer. General matters of interest to the manufacturers of various water-purifying apparatus were discussed and committees appointed for carrying on the work of standardization in various departments. One matter of particular interest to engineers and architects generally was the adoption of a standard specification for pressure filters which will require the submission of bids upon a recognized standard basis, instead of the haphazard method that has been pursued in the past. These specifications will appear in full in the May issue of THE AMERICAN CITY.

The Modern City

AND ITS GOVERNMENT. By WILLIAM PARR CAPES

Secretary, N. Y. State Conference of Mayors and Other City Officials; Director, N. Y. State Bureau of Municipal Information; Co-Author of "Municipal Housecleaning."

The author's unusual opportunities for the thorough study and comparison of various forms of city government enable him to produce an exceptionally valuable book. He discusses the essentials of good government, the responsibilities of citizenship, city charters, types of government, public schools, the cost of government, etc.

The Boston Herald: "A comprehensive study of government policies and problems in our American cities, both East and West . . . invaluable to city officials and to everyone, whether in city, town or village, who want to see the community so organized and managed as to produce more comfort, better health and better surroundings and conditions."

\$5.00 Indexed and fully illustrated with graphs and diagrams.

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You will be greatly surprised to find how little more it takes to buy a Packard Truck than to get just an ordinary truck.

In many cases, the first cost of a Packard is actually lower than that of others, and in all cases its final cost is much lower.

Its certainty of performance, its economy of upkeep, and its security as an investment, all combine to make the Packard Truck at its present price the greatest value in the motor truck market today.

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It is a thoroughbred in design, materials, and workmanship. Its quality is the rugged quality essential for long life, freedom from trouble, and low-cost operation.

Have your Packard dealer quote you the figure at which the Packard Truck is selling today. He is ready to advise with you also on any special or body equipment you may require for the economical handling and hauling of your products.

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and in price from \$3,100 to \$4,500, at Detroit*

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Volume

XXVI

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The Business of Water-Works Management—Part I

By George A. Johnson

Consulting Engineer, New York City

IN the management of municipal business no other essential element is so incompletely understood by the taxpayer as is the charge for water service. Water departments often work from hand to mouth, matching expenditures against appropriations made by budget committees that all too frequently fail to sense the real needs of those departments and that always have one alert eye on the sum total of the budget.

Innumerable articles on the subject of water-rates have been prepared by water-works engineers. Most of them have been written around difficulties experienced by privately owned water companies in returning from the business a revenue satisfactory to their stockholders. There is no question that it was formerly an up-hill job for private utilities to get what they considered equitable rates permitting them to render competent service and at the same time ob-

tain a fair net return on their business. Latterly public service commissions have been instrumental in aiding private interests to get higher rates, but in the majority of instances this result has been accomplished against the will of the taxpayer and

without the prosecution of intelligent campaigns of public education respecting the necessity, fairness and equity of such procedures. Many cases have been dragged into the courts which could just as well have been kept out of them by adequate, and at the same time simple, explanation of the controlling phases of the problem involved, such as could readily be comprehended by the man who had to stand the raise and pay the bill, namely,

the humble taxpayer and consumer.

The proper management of a municipally owned water-works system is a mere matter of business, just as is the management of a privately owned water-works system. To

This article avoids the more abstruse technical phrases which easily enter into discussions of charges for water service. The author realizes the difficulties experienced by municipally owned water departments in obtaining rates and appropriations sufficient to permit entirely satisfactory water service to be given at all times. He explains the requirements involved in this most essential public utility and shows how each individual taxpayer should become an understanding partner in the enterprise which gives him, without unnecessary or inequitable cost, constant, safe and reliable service in the second of the three chief essentials of human existence.

render a public service costs money, and to render it to the entire satisfaction of the community costs more money. This service must be paid for by every taxpayer, and the points at issue resolve themselves into what in the last analysis are simple considerations, namely:

1. What is the character of the service required, to give to the community an adequate supply of water, safe for primary purposes, satisfactory for industrial uses, and supplied under the pressures required by local controlling conditions?

2. What is the cost of rendering such service, giving due consideration not only to the debt outstanding against the water-works system, but also to the cost of future extensions and maintenance, and presupposing competent and economical management in all departments?

With these essential bases established, the solution of the problem is an elementary consideration. There must be an equitable balance established between demand and supply. Service of a certain character is required and costs so much money. Water-rates must be adjusted so as to obtain the necessary total revenue to meet those costs. With the two cardinal points definitely determined, it is just as improper for a community to run its self-owned water-works system at a loss as it is to expect the investors in a privately owned water-works system to forego the basic consideration of a fair return from the enterprise in which they have placed their money.

In the adjustment of water-rates to each character of service the fundamental considerations are equally simple. An inequitable burden cannot properly be placed upon industrial establishments any more than it is likely to be accepted without protest by the consumers of small but quite constant daily volumes of water. Every reasonable consideration must be given to the manufacturer who constitutes the financial backbone of the community's prosperity; for, with an unbalanced and abnormally high water-rate, his costs of production are thrown out of proportion, and he is then placed under an unnecessary and unwarranted handicap. This may force him to develop a water-supply from a private source, or to move his factory elsewhere. All this means lost revenue to the community, not only in its water department, but in the unemployment of its people.

Bases for Rate-Making

In establishing a scale of rates for water service, consideration must first be given to an estimate of the cost of production of that service. Arriving at the total, and adding to that a reasonable factor of safety, the municipality takes its next step in adjusting the charges for various classes of service so as to give every consumer a fair deal.

The cost of rendering service may be summed up from the following main items:

(a) Bonded indebtedness, represented by that sum of money required annually to retire outstanding bonds, and for interest on the existing debt

(b) Annual overhead charges for administration, including rentals, taxes, insurance and legal expenses; salaries and wages of the force required for operation and maintenance of the system; and a suitable sum for supplies and materials required for ordinary operation, maintenance, repairs and replacements

(c) Working capital or reserve fund

The first item is a definite and fixed charge, which needs no explanation. The second item requires, first, the presupposition that the administrative force is cut to the minimum capable of rendering competent service. Taxes, rentals and insurance charges are amenable to practically no argument. Legal expenses ordinarily are merely nominal. Salaries and wages are governed by law or local regulations or customs. The practice of laying in a stock of supplies and materials at annual intervals makes for stability of the budget. This item will vary from year to year, depending upon prevailing prices and upon the predicted requirements of the time, chiefly as regards needed repairs and renewals which can be competently predicted well in advance by an efficient administrative and operating staff. The working capital, or reserve, is one made up of annual allotments toward a fund of considerable size which will be needed for relatively expensive replacements or extensions at some time in the future, and which can also be predicted with reasonable accuracy. If no such reservation is made, then when the necessity of making such improvements comes, it is the common custom to raise the necessary money by special bond issue. This made, the annual charge for interest on, and retirement of, the new bonds becomes a fixed charge to be added to the charge on the old debt.

The Pay-As-You-Go Policy

To function properly and with the least possibility of friction with the community, a water department can best take care of the majority of new bond issues by predicting future replacements and extensions well in advance and laying aside annually enough money to defray such extraordinary expense when the time of need arrives. Thus each generation will care for its own requirements at its own expense, instead of unpreparedly awaiting the inevitable hour when it will be necessary to go to the taxpayers for their voted approval of a new bond issue to meet the cost of sadly needed extensions and improvements for which the coming generation must pay.

The present generation frequently protests against the necessity of paying for improvements made by the preceding generations who tried to anticipate the requirements of their successors. It were far better that each generation should care for itself, and pay as it goes.

In the operation of such a plan of continuous financing, it is more than ever necessary that by sound legal enactments the surplus funds of the water department shall be rendered inviolable except for their first intended uses, namely, the anticipated improvements in the water-works system for which such funds are constantly being built up. Furthermore, water departments should be absolutely divorced from politics. Men who have proved their competence by actual service should not be subject to removal for any other cause than unfaithfulness to their duties. Certainly, municipal water departments should never be made the chess-boards of political leaders, the happy hunting-grounds of incompetent men who have been faithful to their party, or a repository for the representatives of potential votes.

That the pay-as-you-go policy set forth above will not meet with the approval of many students of, and authorities on, water-works financing, the author is perfectly well aware, but the thought is advanced on the ground that, once inaugurated at the expense, perhaps, of the living generation, the burden thereafter is distributed just as equitably as ever before. The present generation thus cares for its own needs, and at least the incipient requirements of each future generation, without necessitat-

ing any further bond issues, except perhaps for some manifestly important work that could not well be anticipated in advance, such as those occasioned by annexation of new areas. The water department is made a continuously self-supporting institution that will not need to appeal to the taxpayers for their approval of new projects of extension and betterment. To obtain the taxpayers' support of such enterprises, extended campaigns of education are usually required. It is necessary to convince the voters that the improvements are really needed, and that their consummation will result in more economical management and better service. Such facts are extremely difficult to impress upon the minds of taxpayers to the degree required in order to obtain their affirmative votes.

Bond issues innumerable have failed for this elementary reason. Worn-out, inefficient and costly-to-operate pumping machinery, mains of inadequate carrying capacity, insufficient reserve storage, incomplete metering, and other deficiencies in water-works systems have been kept in service because the public would not vote the necessary authority to raise by new bond issues the required funds to correct them. This has resulted in poor and uneconomical service, and in increased fire hazard and insurance rates, and all because of the taxpayers' lack of comprehension of the proper needs of the water department. Very often, indeed, the money wasted in a relatively short period on account of the forced continuance of an inadequate and inefficient system would easily have defrayed the cost of the needed improvements, and the community would all the time have enjoyed better service and adequate protection against fire hazard.

Twenty years ago it was a herculean task to impress the average taxpayer that purification of his surface water-supply was needed for the conservation of his health and comfort. To get him to agree to contribute for himself and each member of his family half a dollar or so each year to defray the cost of such purification of the water-supply of his community, was a hopeless undertaking.

Editorial Note.—This article will be continued in the June issue of THE AMERICAN CITY, covering classes of service, adjustment of rates, and a business basis for water-works management.

Making a Municipal Light and Water Plant Pay

Low Electric and Water Rates Made Possible Through Efficient Management

By G. H. Cairns
City Manager, Gainesville, Fla.

THE municipal light and water plant constructed in 1913 at Gainesville, Fla., has consistently proved that a publicly owned utility in a town of 5,000 can deliver good service to its patrons at a very low rate and at the same time be a source of revenue to the city.

At the time the plant was built and placed in operation, the peak load was hardly more

and light plant, was given to the City Manager.

As a revenue-producer, the plant has shown up more favorably each year, so that at present the margin of profit is considerable without in any way lowering the grade of service to the consumers. The recent savings have been made possible by coordinating the several departments so that



EXTERIOR OF THE GAINESVILLE, FLA., MUNICIPAL POWER-PLANT

than half of the capacity of the plant. The demand for power has so increased, however, that the present equipment is 20 to 35 per cent overloaded and work is being rushed to install a 500-kilowatt turbo-generator. Additional pumping equipment will also be installed shortly.

The operation of the plant, with that of all other public utilities, was in the hands of the Board of Public Works until June, 1921, when the management of nearly all the city departments, including the water

they function more efficiently and eliminate unnecessary overhead expense.

In spite of the fact that Gainesville is one of the smallest cities in Florida, it has about the lowest rates quoted in the state and is not supported by any supplementary funds from reserve or taxation. With the growth of the city and the extensive building since the war period, the plant has been obliged to make additions which in most cases would have caused plants to borrow capital or raise the rates. This plant, however, has

met all the requirements in the way of extensions in the face of the rise of fuel oil from \$1.17 to \$1.72 per barrel, and has furnished current for lighting purposes on a sliding scale that averages less than 7 cents per kilowatt hour. For power the average rate is about 4 cents per kilowatt hour, and the heating rate is 2½ cents per kilowatt

hour flat. The minimum charge in all cases is \$1 per month for electricity or for water. In the case of water rates, an allowance of 24,000 gallons per quarter is made for the minimum charge of \$3. In the sale of water to all types of services the rate drops to 10 cents per 1,000 gallons after 40,000 gallons have been used in the three-months period.

Brick Pavement Reconstruction in Meridian, Mississippi

By John C. Watts

City Engineer, Meridian, Miss.

LAST summer in Meridian, Miss., some 7,500 square yards of brick pavement were relaid with brick which had originally been laid on the same street 23 years before. During the 23 years the bricks were in service they had been subjected to severe traffic conditions. Twenty-second Avenue, the street referred to, was laid in the fall of 1898 under the direction of the late Waldo G. Myers, then City Engineer. The bricks were laid with a 2-inch sand cushion on a 6-inch slag cement base of 1:2:5 mix. Sand filler was used in the joints, and the contract price was \$1.80 per square yard.

For years this type of construction held up without a flaw. The traffic could be termed "heavy" from the start, but in later years it became exceedingly heavy on this particular thoroughfare. Gradually, because of the further compacting of the sand cushion in some instances, and in others because of the wearing of the brick, which obviously were laid before the modern methods of testing brick were established, depressions appeared in the surface.

It became evident in 1921 that steps should be taken to improve the condition of the surface and preserve the street. The Engineering Department of the city advised



A STREET REPAVED WITH OLD BRICK—INSET SHOWS CONDITION BEFORE RELAYING

reconstruction and suggested that the same brick be relaid on a repaired base. Bonds were voted by the city and specifications prepared by the Street Department. After bids had been received, the work was awarded to the Southern Paving and Construction Company of Chattanooga, Tenn., at 65 cents per square yard.

The bricks were taken up and stacked along the curb line. The sand cushion was re-raked, depressions filled in, compacted and raked over, and then the entire surface was thoroughly compacted. The bricks were then relaid flat and rolled with a 3-ton roller. The joints were filled with asphalt filler at the rate of about 2 gallons of asphalt per square yard, according to the specifications of the National Paving Brick Manufacturers Association. This pavement as relaid has been very satisfactory, giving an even surface, and should last for at least another 23 years.

A rather unusual accident occurred on

Twenty-second Avenue shortly after it was paved, demonstrating the durability of a 3-inch brick wearing surface laid with asphalt filler on a gravel base. At the point referred to, Twenty-second Avenue runs through the railroad yards and is subjected to heavy trucking. One night heavily loaded box cars were backed too vigorously against the bumper beside the street. The cars crashed over the sidewalk onto the avenue and across to the opposite side of the street with such force as to crush the sidewalk and granite curbing on both sides. Neither the 6-inch rolled gravel base nor the 3-inch brick showed any ill effects of the tremendous weight of the loaded cars except at the point of greatest impact, where the wheels dropped nearly a foot from the curb to the pavement. A bare trace of the steel-flanged wheels is noticeable the entire distance across the pavement, and even this marking is mainly due to the thin layer of asphalt filler remaining on the surface of the bricks.

Census Bureau Revises City Finance Data

Revised figures just received from the Census Bureau make necessary the follow-

ing corrections in the tables printed in the April issue of THE AMERICAN CITY:

State and City	Per Capita			Deficit	Per Capita Debt Minus Sinking Fund Assets			Form of Government
	Cost	Receipts	Surplus		1920	1917	1914	
<i>Alabama</i>								
Mobile	19.25	18.75	....	.50	50.45	50.21	56.19	
<i>Massachusetts</i>								
Lawrence	36.81	40.95	4.64	....	34.04	39.04	28.21	
New Bedford	51.59	45.84	....	5.75	72.92	75.07	74.98	
<i>New Jersey</i>								
Hoboken	79.22	39.94	....	39.28	115.31	59.72	44.21	Commission
Passaic	29.77	25.16	....	4.61	50.61	46.57	43.58	Commission
Perth Amboy	57.98	36.53	....	21.45	74.67	53.62	38.88	Council

Standard Specifications for Pressure Water Filters

Specifications Adopted by Associated Manufacturers of Water Purifying Equipment Are Recommended for Consideration

IN the standard specifications for pressure water filters recently adopted by the Associated Manufacturers of Water Purifying Equipment, the rates of filtration are based upon the "Report of Committee on Recommended Standardization of Filters" of the American Society of Mechanical Engineers, presented at its annual meeting,

December, 1916. This report fixes the rate of filtration for potable water as follows:

"Whenever the water is to be used for domestic purposes or to secure full bacterial purification, the capacity shall be based upon a rate of filtration not to exceed 2 gallons per minute per square foot of filtering area, and a coagulant must be used."

A full report of the Committee is con-

tained in the Transactions of the A. S. M. E. for 1917, pages 425-432.

Rates of filtration for various uses should conform to the following schedule:

- 2 gallons per square foot per minute for all supplies used for drinking, or for the preparation of food products.
- 2 to 4 gallons per square foot per minute when filtering a treated municipal supply of approved bacterial purity.

2 to 4 gallons per square foot per minute for swimming pools and for all industrial uses.

2 to 5 gallons per square foot per minute as conditions may warrant for double filtration, using sand followed by charcoal where reduction of color, odor, taste, or certain forms of iron is desired. This method of filtration not to be applied for bacterial purification.

DIMENSIONS AND CAPACITY DATA FOR STEEL AND CAST IRON PRESSURE FILTERS—SPECIFICATIONS RECOMMENDED BY THE ASSOCIATED MANUFACTURERS OF WATER PURIFYING EQUIPMENT

Capacities per Min. for Rates of 2, 3 and 4 Gal. per Sq. Ft. per Min.

Filters Standard Sizes	Dia.	Area	Capacities per Min.			Pipe Connections		Min. Wash Water at 12 Gals. Per Sq. Ft. Per Min.
			2 Gals. Per Square Foot	3 Gals. Per Square Foot	4 Gals. Per Square Foot	Inlet P. Wash	Waste to Sewer	
12"		.785	1.57	2.35	3.04	3/4"	1"	9.42
14"		1.06	2.12	3.18	4.24	1"	1 1/4"	12.72
16"		1.39	2.78	4.17	5.56	1"	1 1/2"	16.68
20"		2.18	4.36	6.54	8.72	1 1/2"	1 1/2"	26.16
24"		3.14	6.28	9.42	12.5	1 1/2"	2"	37.
30"		4.90	9.8	14.7	19.6	1 1/2"	2"	60.
36"		7.06	14.1	21.1	28.2	2"	2 1/2"	84.
42"		9.62	19.2	28.8	38.5	2"	2 1/2"	115.
48"		12.56	25.1	37.6	50.2	2 1/2"	3"	150.
54"		15.90	31.8	47.7	63.6	2 1/2"	3"	190.
60"		19.63	39.2	58.8	78.5	3"	4"	235.
72"		28.27	56.5	84.8	113.1	4"	5"	339.
84"		38.48	76.9	115.4	153.9	4"	5"	460.
96"		50.27	100.5	150.8	201.1	5"	6"	600.

L = overall length of filter, and area of bed is calculated for surface of bed 18" above center of shell.

Area of segments of the 2 dished heads = 9.2 sq. ft.
 Area per lineal foot of bed in the cylinder = 7.42 sq. ft.
 Example: 8' x 16" filter area per head = 9.2 sq. ft.
 Area in cylinder 14 x 7.42 = 103.9.
 Total effective area = 113.1 sq. ft.

Horizontal Filters

Horizontal Filters	Dia.	Area	2 Gals. Per Square Foot	3 Gals. Per Square Foot	4 Gals. Per Square Foot	Inlet P. Wash	Waste to Sewer	Min. Wash Water at 12 Gals. Per Sq. Ft. Per Min.
8' x 10' L	68.5	137.	205.5	274.0	360.	6"	8"	822.
8' x 12' L	83.4	166.8	250.2	333.6	441.6	6"	8"	1000.
8' x 14' L	98.2	196.4	294.6	392.8	520.8	6"	8"	1178.
8' x 16' L	113.1	226.2	339.3	452.4	604.8	8"	10"	1357.
8' x 20' L	142.7	285.4	428.1	570.8	761.6	8"	10"	1712.
8' x 25' L	179.8	359.6	539.4	719.2	958.4	8"	10"	2157.

Construction of Steel Pressure Filters

Standard manholes 11 x 15 inches, or 10 x 16 inches.
 Tensile strength of steel plate 55,000 lbs. to 65,000 lbs.
 Heads dished to radius of diameter of tank
 Hydrostatic test 50 per cent in excess of working pressure

Vertical Steel Filters

Working Pressure 35 pounds per sq. in.	Shell			Head Thickness	Shell			Head Thickness	Shell			Head Thickness
	Min. Eff.	Thick-ness	Thick-ness		Min. Eff.	Thick-ness	Thick-ness		Min. Eff.	Thick-ness	Thick-ness	
24"	50%	3/16"	3/4"	50%	3/16"	3/4"	5/16"	50%	3/4"	5/16"	5/16"	
30"	50	3/16"	3/4"	57	3/4"	5/16"	50	5/16"	5/16"	5/16"	5/16"	
36"	50	3/16"	3/4"	57	3/4"	5/16"	70	3/4"	3/4"	3/4"	3/4"	
42"	57	1/4"	5/16"	70	3/4"	3/4"	70	5/16"	5/16"	7/16"	7/16"	
48"	57	3/4"	5/16"	70	5/16"	7/16"	70	5/16"	5/16"	7/16"	7/16"	
54"	57	3/4"	3/4"	69	3/4"	7/16"	67	7/16"	3/4"	3/4"	3/4"	
60"	57	3/4"	3/4"	69	3/4"	9/16"	66	9/16"	9/16"	9/16"	9/16"	
72"	72	1/4"	3/4"	68	3/4"	3/4"	68	3/4"	3/4"	3/4"	3/4"	
84"	70	5/16"	7/16"	66	3/4"	3/4"	66	9/16"	9/16"	11/16"	11/16"	
96"	69	3/4"	7/16"	68	3/4"	3/4"	68	3/4"	3/4"	3/4"	3/4"	

Cast Iron Pressure Filters

To be gray iron casting having a tensile strength of approximately 20,000 pounds per square inch.
 Hydrostatic test 50 per cent in excess of working pressure to be applied.
 Heads dished to radius equal to diameter of shell may be modified with rib reinforcement to same thickness as shells.
 Variations of 1/8" in these thicknesses of shells and heads and flanges to be permissible.

Filter	65-Pound Working Pressure			100-Pound Working Pressure		
	Shell Thickness	Head and Flange Thickness	Head and Flange Thickness	Shell Thickness	Head and Flange Thickness	Head and Flange Thickness
12"	3/4"	3/4"	3/4"	5/8"	7/8"	7/8"
14"	3/4"	3/4"	3/4"	11/16"	15/16"	15/16"
16"	3/4"	3/4"	3/4"	11/16"	15/16"	15/16"
20"	11/16"	15/16"	15/16"	3/4"	1"	1"
24"	11/16"	15/16"	15/16"	13/16"	1-1/16"	1-1/16"
30"	3/4"	1"	1"	3/4"	1 1/8"	1 1/8"
36"	13/16"	1-1/16"	1-1/16"	15/16"	1-3/16"	1-3/16"
42"	13/16"	1-1/16"	1-1/16"	1"	1 1/4"	1 1/4"
48"	3/4"	1-1/8"	1-1/8"	1-1/16"	1-5/16"	1-5/16"

Water-Works Supply Men Help Superintendents

Sales Interviews Highly Educational If Taken in Proper Spirit

AT the March meeting of the New York Section of the American Water Works Association, Beekman C. Little, former President of the American Water Works Association, and Superintendent of the Rochester, N. Y., Water Works, gave a most interesting and instructive talk on the value of the water-works supply man to the superintendent.

Mr. Little has found in his prolonged dealings with the water-works supply men that they often give much more than they get in value received. Most, if not all, of the well-known supply men have ideas and ideals beyond the mere making of money from their products. There are many interesting examples of the results of research and study by manufacturers of water-works supplies. Among them may be noted the preparation of a substitute for lead for jointing cast iron water-mains; vast improvements in water-meters; the now well-known fire line meters and improved fire hydrants.

In addition to mentioning the value of these products of manufacturers, Mr. Little laid stress on the service organizations whose help has meant much to water-works superintendents. A typical example is the company which cleans water-mains, thus saving much money for various communities, besides preserving some of the pipes and supply mains which otherwise would have been abandoned or replaced. By its work this company has bettered health statistics and prevented the destruction of considerable property by fire. The idea and the method followed in this work are the result of considerable technical knowledge and mechanical ingenuity. The superintendent gets much more in results from contact with these men than appears in the mere labor of cleaning the mains.

The water-waste survey men are being recognized as very necessary adjuncts to water-supply systems. The older and larger the system, the better and more valuable the work they can and do accomplish. Water-works superintendents should get

over the idea that it is only the poorly constructed or inefficiently managed water plant which can be bettered by such a survey. Almost any sane-minded water-works superintendent will admit that a properly constructed growing water system can lower its consumption considerably by metering. Even a good water-works system, 100 per cent metered, can be immeasurably improved by a well-conducted water-waste survey.

Water-works superintendents are amazed at the amount of waste discovered by these surveys in plants efficiently managed. They know how much water is being sent through the system and from how much of this revenue is derived. There is, of course, a discrepancy. An estimate is made that a great quantity is used in sprinkling and washing down the many miles of brick and asphalt streets and in flushing sewers and in street contract work. A considerable percentage is allowed for public drinking fountains and watering troughs. A certain percentage is unmetered water used in park systems, and the under-registration of meters is blamed for some of the other unaccounted-for water. Hydrants and valves are kept in good repair, and large and small breaks are attended to as soon as they give evidence of their presence, and so the average water-works superintendent, until recently, considered that other leaks, if any, were unimportant. Mr. Little himself was rather skeptical about a water-waste survey in Rochester, N. Y., as that city is 100 per cent metered and its per capita consumption only about 90 gallons daily, which is about as low as the larger cities can hope to get with the extravagant use of water prevalent in these days.

In Rochester a contract was let for a small section covering about one-eighth of the system. This first contract resulted in shutting off a waste of water of over 1,000,000 gallons per day, with other incidental benefits, and the leaks and broken mains repaired would not have been discovered otherwise except incidentally.

Planning the City's Lighting

By L. A. S. Wood

AN ornamental street lighting system that affords adequate illumination at night, and is inconspicuous in the daytime, harmonizing closely with the general scheme of architecture in the various parts of the city, is a source of municipal pride. The beauty of a city's thoroughfares is not apparent at night unless they are properly illuminated.

Proper lighting requires that the intensity of illumination be varied to meet the requirements of the different sections of the city. Streets and avenues in the business districts, where the traffic is heavier, for instance, require more light than those in the residential districts. The right amount of illumination is as necessary for effective street lighting as is the right method of illumination.

Disregard of this principle is particularly noticeable where large business concerns, or groups of them, have at different times installed various ornamental street lighting systems. Such an indiscriminate selection results in illumination of varying degrees of intensity, and also in many different styles of ornamental posts along the same street and often on adjacent properties. In order to avoid this haphazard scattering of illumination throughout the city, electrical engineers have turned their attention toward designing uniform systems of ornamental street lighting.

The Single-Light Post

One of the best results of the adoption of the present-day high-efficiency gas-filled incandescent lamp has been the development of many artistic and harmonious designs in ornamental posts using a single high-power lamp. In the past, ornamental post lighting has been accomplished by means of cluster posts, using two, three, four or five small lamps on one post. These small lamps were inefficient and the system was expensive because of the large amount of energy required for their operation and the high replacement cost of lamps and glassware. Cluster posts have also the disadvantage of being only partly illuminated at times because of lamps burning out. The

largest lamps, as used in the single-light post, are much more efficient than those used in the cluster post.

In addition to its many advantages from an operating standpoint, the single-light post is admittedly superior in appearance to the cluster post, adding to the beauty of the street under both day and night conditions. It relieves the street of the crowded appearance resulting from too many small lamps and gives an effect of elegance, combined with illuminating efficiency of the highest order.

The installation of a good lighting system is something that demands considerable thought and planning. Not alone the lighting system, but also the ornamental posts, the kind and shape of glassware, and the proper placing of the posts, must be given careful study.

There are many streets and driveways which are beautifully lighted at night but which lose all of their pleasing appearance by day. This may be explained by studying the lamp-posts. It will be found that the posts installed are huge and clumsy and poorly located, and do not harmonize at all with their surroundings; such posts, in fact, mar the entire aspect of the street by day.

Different Requirements for Different Sections

Different kinds of street lighting must, of course, be installed in different sections of the city. That which would be appropriate for the business section would not necessarily be suitable for the residential district or the driveways, and vice versa. Generally speaking, city streets may be divided into four classes according to the intensity or amount of light required and the type of equipment usually employed:

- Main business streets
- Minor business streets
- Residence streets
- Byways and outlying districts

Main and minor business streets are usually brilliantly lighted with ornamental posts spaced at intervals of 50 to 75 feet, symmetrically arranged opposite each other on either side of the street, the size of lamp,



A WELL-LIGHTED BUSINESS THOROUGHFARE

spacing distance and mounting height being determined by the relative importance of the streets.

In the residence districts, a staggered arrangement is usually adopted for the ornamental posts, with wider spacing and smaller lamps, the main object being to furnish enough light to see by. It must be possible for pedestrians to make their way about at night without inconvenience or danger from accident or attack. The outlying district or byways, where traffic is light, may be illuminated with streethoods suspended from brackets, mast arms or cables, as local conditions require. Streethoods have been used to a great extent in the past without glassware and, while the appearance of the bare lamp was not objectionable, when the lamp used was of the vacuum type, the glare from the bare "gas-filled" lamp was very unpleasant and often proved dangerous in its dazzling effect. Modern practice recommends the use of diffusing or refracting glassware with streethoods equipped with special type "C" lamps to soften the glare or to direct the light into the useful plane.

In many cities, there are some exceptionally wide streets or important boule-

wards, and these require special treatment. Usually lamps of higher intensity than those used in the main business sections are used, and the mounting heights are increased. This type of lighting is known as "Super White Way" lighting, and single and duplex posts, varying in height from 18 to 22 feet, have been designed to meet these special requirements.

The desirability of using lamps of adequate size cannot be too strongly stressed. It is very poor economy, when designing an ornamental street lighting installation, to attempt to save on the maintenance cost of the system by using small lamps. The investment in posts, cable and equipment is practically the same for all sizes of lamps, and the increased maintenance cost of the higher candle-power lamps is comparatively small as compared with the increased candle-power.

The ornamental lighting unit, or post top, is generally designed so that a large part of the light is directed to the surface of the street or sidewalk, although there should be enough light thrown in an upward direction to illuminate the façades of the buildings. When diffusing glassware is used, the globe should be of sufficient

density to conceal the lamp filament and soften the light without greatly reducing the efficiency of the unit. The entire top should be designed in such a manner as to direct the maximum of useful light to the plane of illumination and at the same time present a distinctive and ornamental appearance.

All the foregoing recommendations should be kept in mind by city lighting

planners if they are to get the highest efficiency from their street lighting system and also keep the cost of maintenance down to the lowest figure. A well-designed ornamental street lighting system pays large dividends in the form of enhanced real estate values. It attracts the favorable attention of visitors and adds to the desirability of the city as a place in which to live.

Iron-Removal Plant and New Pumping Station at Hightstown, New Jersey

By Waldo S. Coulter

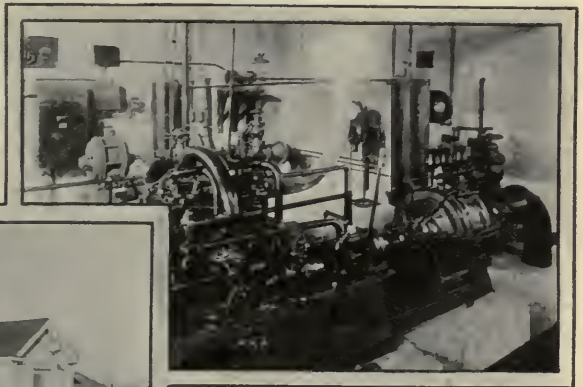
Consulting Engineer, New York City

A NEW pumping station, embodying a closed-system iron-removal plant, was recently placed in operation at Hightstown, N. J. The iron-removal end is of a type unusual in this country, as it disposes altogether of aeration and double pumping, the water being withdrawn from a battery of wells by direct-suction draft and forced into the system through pressure filters by a single operation. The removal of iron and free carbon dioxide is effected by the injection of a dose of lime into the main suction pipe. Reaction with

the free carbon dioxide and ferrous carbonate occurs, resulting in the production of calcium carbonate and ferrous hydrate, which are intercepted at the surface of the sand in the filters. The hardness of the water is increased; in this case from a total hardness of 25 to 35 p. p. m., calcium carbonate equivalent, to about 60 to 75 p. p. m. The treated water is therefore what might be termed a medium water.

The cost of lime at Hightstown amounts to about ½-cent per thousand gallons. This is for a raw water containing about 45

HIGHTSTOWN PUMPING STATION
WITH FILTER HOUSE IN
BACKGROUND



INTERIOR OF STATION FROM
ENTRANCE STAIRWAY

p. p. m. of free carbon dioxide and 5 parts of iron.

To secure a direct-suction draft from the battery of wells, and avoid the expense of an air-lift system, the floor of the pump house is depressed. The filters are installed above the ground surface.

The Pumping Equipment

To keep down the cost and secure machinery light enough to operate without special heavy foundations, centrifugal pumps are used. One is direct-connected to an electric motor by a flexible coupling, for regular operation, and the other is similarly connected to a 4-cylinder Van Blerck engine, modified for kerosene. Special provisions have been made to automatically intercept and release air and gas in the main suction and pump casings. These, with an automatic primer, enable the centrifugals to draft smoothly and reliably from the wells through long suction piping, and with a suction lift.

Hydrated lime is measured and fed by a dry-feed machine, mixed with an automatically regulated supply of water in a suction tank and drawn into the main suction by action of the tank. The station is provided with a Venturi meter and indicator-recorder, a recording pressure-gage and other measuring devices. It has inside fire protection and electric lighting and is heated by stoves.

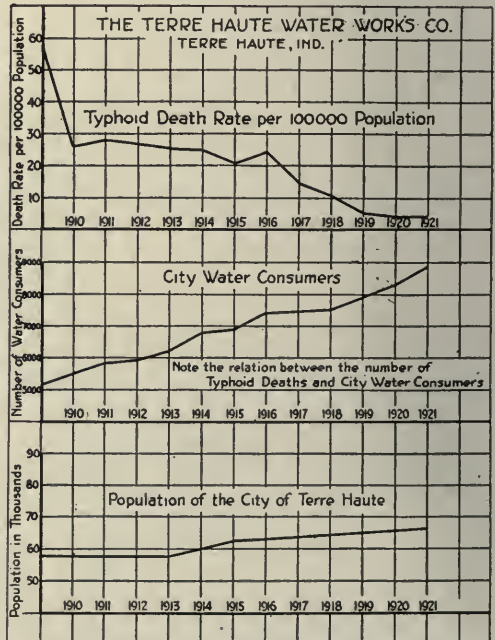
The capacity of the station is 720,000 gallons per day, and it is so designed that this may be increased to 1,200,000 without altering the building or piping. The contract prices for the entire work, including suction piping, connections and concrete head-chambers at wells, etc., totalled \$51,394. The contracts were awarded at the peak of high prices in September, 1920. The general contractor was John R. Proctor, Inc., of New York and Bayonne. The filters and dry-feed machine were supplied by the New York Continental Jewell Filtration Company.

Typhoid Fever Mortality in 1920

THE Bureau of the Census has recently announced the mortality rates for typhoid fever in the registration area for 1920. It is well known that the amount of typhoid fever in a community is recognized as one of the best indexes of the community's healthfulness and in addition is a very important sanitary index. The steadily decreasing mortality rate from typhoid is therefore very gratifying. The rate has decreased, in the registration states, from 13.3 per 100,000 population in 1916 to 7 in 1920 for the same states. In 1920 Massachusetts and Wisconsin shared the honor of having the lowest rate, 2.5 per 100,000, and the highest, 22.4 per 100,000, was found in South Carolina.

Of the eleven states showing rates by color, the lowest rate for the white population was 3.6 and the lowest for the colored was 4.6, both for New York State, while the highest rate for the white population was 19.1 for Kentucky and 30.2 for the colored in the same state.

The accompanying illustration shows how chlorination can reduce typhoid fever.



AN INTERESTING TYPHOID FEVER RECORD FROM TERRE HAUTE

Developing a City Park by Reforesting

Charlotte, Michigan, Makes a Forest Plantation

By P. L. Buttrick

Assistant Professor of Forestry, Michigan Agricultural College

THE city of Charlotte, located in south central Michigan, has in Bennett Park one of the most beautiful forest parks in any small city of the Middle West. The park was given to the city a number of years ago by the public-spirited citizen whose name it bears. It consists largely of a rather heavily wooded tract of maple, elm and oak, which except for the addition of a few roads and trails has fortunately been left in a natural condition.

Adjoining this park on two sides there was a tract of about twenty acres of rather sterile gravelly land, part of which was an abandoned gravel-pit. It sloped towards a stream flowing through the main park and was topographically a part of the park. Although this tract was the property of the city and favorably located for park pur-

poses, it had never been incorporated in the park or improved in any way.

In the spring of 1921 the matter of improvement of this tract and its addition to the park was taken up by George Fenn, who has since been elected Mayor of Charlotte, and a number of other interested citizens. The committee requested the aid of the Forestry Department of the Michigan Agricultural College in preparing a plan for improving this tract and adding it to the park. The Department studied the situation on the ground and proposed to the city that since Bennett Park was primarily a forest park, the addition should be in keeping with it; and stated that this could best be accomplished by planting the area to young trees and by laying out roads in the addition to be continuous with those



CHARLOTTE CAN LOOK FORWARD TO A FOREST LIKE THIS IN ABOUT TWENTY-FIVE YEARS
Scene on the lands of the Michigan Agricultural College, showing trees planted in 1896

in the park. It was further proposed that the larger portion of the plantation be made of white pine, since this is a tree which grows well on gravelly, sterile soil and would succeed in the abandoned gravel-pit, where most trees would not grow at all. Furthermore, although the white pine is Michigan's best known tree and intimately connected with her history, it does not occur naturally in the region of Charlotte. When planted there it grows well. A plantation of white pine would therefore have a historic value as well as a distinctly landscape value. Bordering the woodland of the original park it was proposed to plant native maples, oaks, etc., and in certain portions of the new park to plant a small grove of nut and ornamental trees. The main plantation, however, was to be of white pine.

A series of public meetings was held and much public sentiment developed in favor of the proposition. The town council soon afterwards voted favorably upon the proposition. It was decided that the citizens should be called upon to assist in planting the trees and that the forest should be dedicated as a memorial to Charlotte's veterans of the World War.

The planting stock was supplied by the Forestry Nursery of the Forestry Department of the Michigan Agricultural College, this nursery being organized to supply forest planting stock to citizens of the state practically at cost.

Nearly 7,000 4-year-old white pine were set out at a spacing of 6 by 6 feet. The trees averaged 18 inches to 2 feet high. The hardwoods occupied a smaller area and were less numerous. Some 400 of the latter were planted at irregular spacing.

A Profitable Undertaking

Since the plantation was set out by citizens who volunteered their services, the labor cost was greatly reduced. Their work was directed at the start by a representative of the Forestry Department of the Agricultural College, as few of the citizens were experienced in this class of work. The pine plantation was cultivated during the summer, but the hardwoods did not require any treatment. Despite the very serious drought of the early summer, the entire plantation came through well. It will be only three or four years before the pines

will be large enough to carpet the ground and be a landscape asset to the park. In ten years they will be saplings twenty or more feet tall and will form a beautiful young wood. In twenty-five years they will be trees upwards of forty feet tall and from six to ten inches in diameter, and their value and beauty will continue to increase for the next hundred years. The illustration taken from an actual plantation indicates what may be expected in the way of growth.

There are thousands of abandoned gravel-pits, sandy stretches and unutilized corners of our parks which could to advantage be used for forest plantations. They add to the landscape value of the parks, and the ultimate value of the timber will frequently make the operation financially profitable.



FIREMEN'S PRACTICE IN SANTIAGO, CHILE,
ON FETE DAY

This display of the gymnastic abilities of the firemen of Santiago, Chile, reminds one of many of the old-time volunteer firemen's exhibitions. Most Central American cities are not backward in fire protection, for they are equipping their fire departments with American motor fire apparatus

Elevated Steel Tank Solves Portland Water-Supply Problem

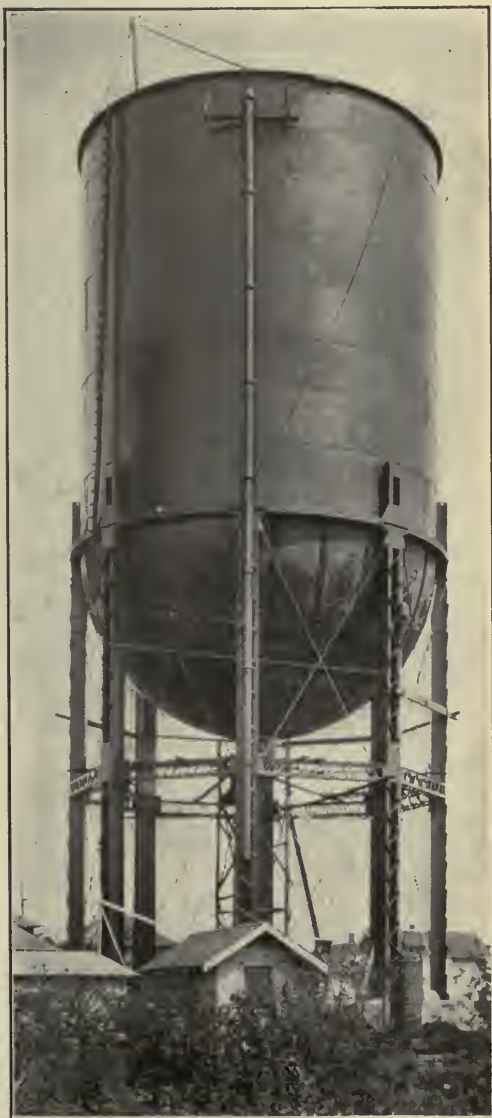
By C. J. Franklin

Hilton-Pike-Oakly Company, Portland, Ore.

THE city engineering officials of Portland, Ore., have given evidence of the city's administrative wisdom by installing an elevated steel tank to insure an adequate water-supply to outlying districts, and at the same time equalize the pressure. The city was confronted with the problem of taking care of a rate of flow reaching a peak load of 21,000,000 gallons at 8 o'clock in the evening during the summer months, through two mains which normally furnish only 12,000,000 gallons a day. After a thorough investigation F. M. Randlett, Chief Engineer of the City Water Department, and his assistant, B. S. Morrow, decided to install a hemispherical-bottom elevated steel tank of 1,000,000 gallons capacity as the most economical, efficient, and permanent solution. This decision resulted in a saving to the city of \$220,000—the difference between the cost of the tank and the amount which would have been expended to secure the same results by providing additional mains.

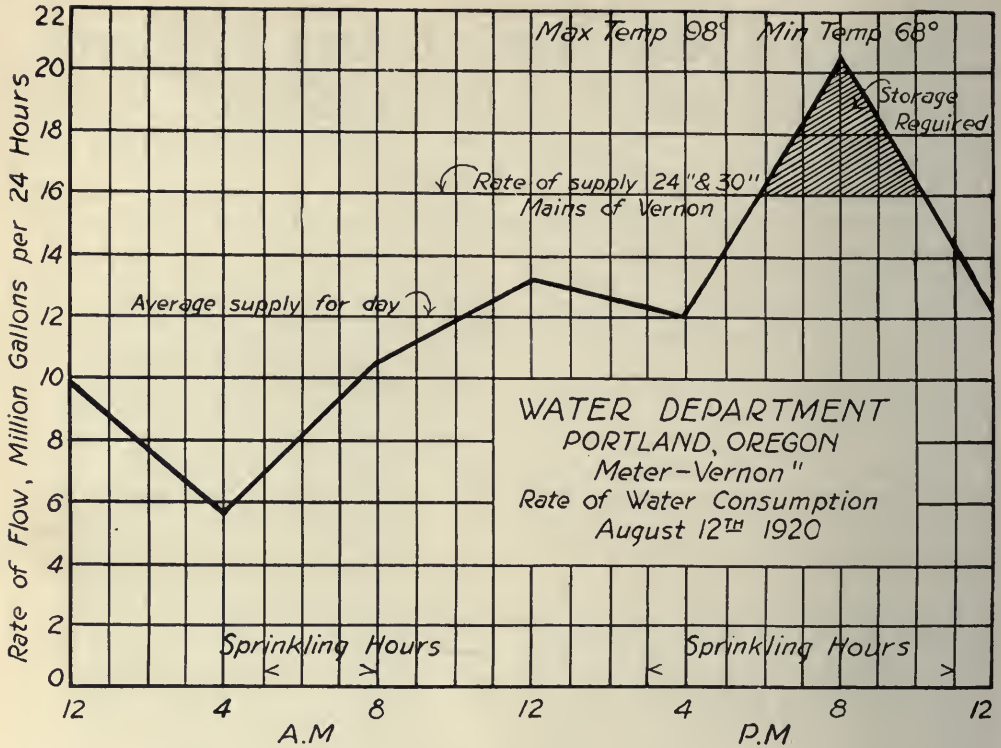
The so-called Vernon system in Portland supplies practically all that portion of the city lying north of Fremont Street and east of Nineteenth Street, and includes St. Johns, University Park, Woodlawn, Kenton, Overlook, and Vernon. Water for this residence district is supplied from reservoirs 1 and 5 by cast iron mains, respectively 24 inches and 30 inches in diameter and approximately 30,000 feet in length. During the heavy-draft period of the summer, the average daily demand for the Vernon system is only about 12,000,000 gallons, but during the sprinkling hours in the evening the demand is almost doubled, reaching a rate of flow of 21,000,000 gallons a day.

The two mains can easily deliver water at the site of the elevated steel tank at the rate of 16,000,000 gallons a day, and the additional amount of water required during the peak period could be supplied in either of two ways—by laying additional mains or



A 1,000,000-GALLON ELEVATED WATER-TANK
IN PORTLAND, ORE.

This tank is 50 feet in diameter, 40 feet high, with a hemispherical bottom, 25 feet high; height of shell, 56 feet; plate thicknesses vary from 13/16- to 1/4-inch



by providing adequate storage to be turned into the system during the peak demand. A 24-inch main capable of providing an additional eight million gallons for this district would cost \$330,000 at the very least, and would be required to function only for a period not to exceed four hours a day during three months of the year.

On the other hand, a million-gallon elevated steel tank discharging into the distribution system during the excess peak demand would meet all requirements and give a certain amount of reserve water in the district, to be supplied for fire protection and domestic demand, and the tank and foundation would cost only about \$100,000. The decision to use an elevated steel tank instead of laying an additional main to this section appears wise in view of the fact that the ultimate development of the further limits of this section will require a large main coming in by an entirely different route, which would render any additional line laid at this time of little value.

The new elevated steel tank is controlled by a two-way altitude valve which permits the tank to fill in off-peak periods and to discharge when the two district regulators

are full open and the pressure in the mains has fallen to about 36 pounds. This condition will occur during the sprinkling hours of the summer months only, or in case of excessive draft, or on account of fire.

As the appearance of the tank structure was of special importance, plans for an ornamental masonry tower were drawn, and specifications were written covering a tank which could be surrounded by an independent masonry wall at some later date. After careful consideration had been given to the different materials suitable for the construction of the tank, steel was selected on account of its absolute reliability, watertightness and reasonable cost. The specifications provided that the tank should have a diameter of 50 feet, a maximum height of 110 feet, and a minimum height to bottom of 40 feet. Furthermore, all steel work should be kept within a diameter of 54 feet, which would allow a space of 2 feet between the tank shell and the masonry for the purpose of inspection and painting. The Chicago Bridge & Iron Works submitted the successful design and was awarded the contract for the steel work of the tank and tower.

A Complete Modern Fire Alarm System

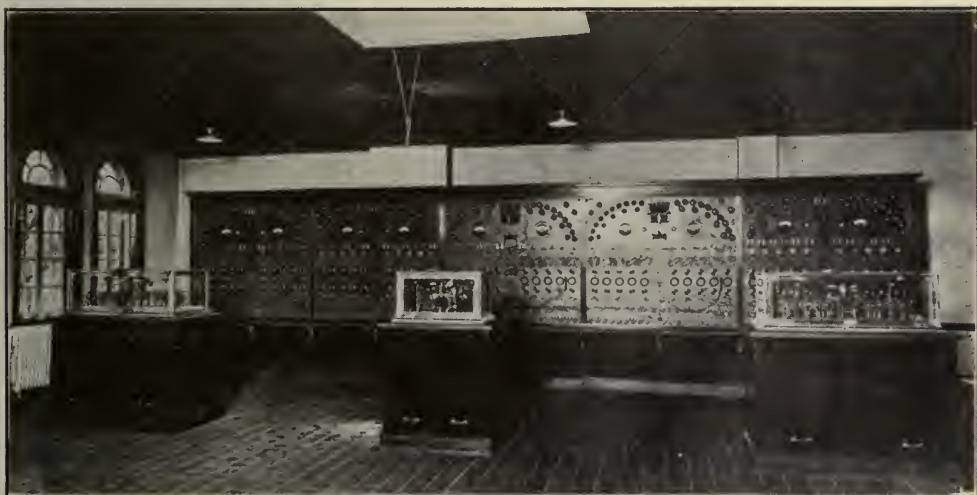
New Equipment at Birmingham, Ala., Gives Full Protection

THE new fire alarm system in Birmingham, Ala., put in service in January, consists of 200 new fire alarm boxes on the streets, 25 miles of underground cable with a total wire length of 306 miles, 216 miles of overhead wire, and a complete new central office.

The central office with its recording and transmitting apparatus is located on the second floor at fire headquarters on Sixth

two, three or even more fires may be received at the same time. On New Year's Day twenty-nine box alarms were received.

The three hundred or more fire alarm boxes are on thirty different circuits. The twenty engine houses are on ten circuits. All these circuits end at fire alarm headquarters. When a box is pulled, a red flashlight on one of the boards in the central office flashes out the signal, and it is



FIRE ALARM HEADQUARTERS, BIRMINGHAM, ALA.

Avenue between 19th and 20th Streets. Running out from here are the circuits which go to the various boxes and also to the twenty different stations scattered all over the city.

The new fire alarm boxes are so arranged that the chief or any of his assistants can go to the nearest box, plug in a special telephone set which is carried in the chief's car, and talk directly to the operators at fire headquarters or, if necessary, with any of the engine houses. This permits him to order any special apparatus to the fire which may be necessary because of the peculiar nature of the fire, or to give special instructions for the disposition of certain companies.

Two operators are always on duty at fire alarm headquarters to handle signals. In a city as large as Birmingham, signals for

also sounded on a tap bell. The signal can be handled at headquarters in three different ways—automatic, semi-automatic and manual.

The central office apparatus can be arranged so that the box number is automatically repeated over all the engine house circuits, and every engine house in the city will receive the alarm. Two big sixteen-circuit automatic repeaters have been installed for this purpose. These are so arranged that if a second box number comes in while another number is going out over the repeater, there will be no confusion. Only such companies will respond to the alarm as have been previously assigned to that box.

The central office can also be operated on a semi-automatic basis. Four rounds of each box number are received at head-

quarters. When operating semi-automatic, the first complete round stops at headquarters, and then the signal can be thrown over to the tapper repeaters and sent out to the engine houses.

When the alarms come tumbling in in rapid succession, the office is operated manually. The alarm is received and recorded on registers which punch holes in a paper tape similar to that used on stock tickers. One of the operators reads off the number and then sets it up on the manual transmitter. The number is checked, a lever is pulled, and the alarm goes out to the engine houses. The second operator attends to all telephone alarms and keeps all records of fire.

Alarms at Engine Houses

Three separate means are provided for sending signals to the engine houses. A register and sounder are mounted on the desk in the engine house, where a man is on duty and signals are received from the central office. A loud-sounding gong is connected over a separate circuit to wake the men at night. When an alarm is received which does not call out that particular company, the man on watch throws off a switch to silence the gong. Telephone facilities are provided to send out any company on the small fires and other still alarms. The waker switch is used in these cases to sound one blow on the gong to arouse the men.

Accurate automatic records of all alarms received and sent out are kept at headquarters. The box numbers are punched out on the register tape and time stamps, which record the day, hour and minute and furnish a permanent record for reference in the future. These stamps automatically take care of long months and short months, and leap year day, and once a century drop a day to keep in step with the calendar.

Back of the central office room is a special room for the storage battery cells which supply the current. Eighteen hundred of these cells, similar in principle to an automobile battery, are necessary to provide the energy to operate the system and furnish a reserve source. Current is taken off the lines of the Birmingham Railway Light and Power Company and stored for future use. Five ten-circuit storage-battery charging boards are installed for efficient economical handling.

The importance of the fire alarm system requires that every possible protection be thrown about the central office apparatus to guard against lightning or high-voltage current. At the end of the room is a 46-circuit protector board equipped with different types of fuses and with a bell to call attention when a fuse is blown out.

The new fire alarm boxes on the streets are of the Peerless, non-interfering successive type. Ten or a dozen fire alarm boxes are usually connected on the same circuit. Frequently two different boxes will be pulled at about the same time for the same or different fires. If these boxes interfered with each other, the alarm would be confused and time lost. If one of these boxes is operated while another box on the same circuit is sending in its signal, the second box will not interfere. At the end of each round the second box will test the line to discover if it is clear. When cleared, it will send in its signal. In this way a number of boxes on the same circuit as the central office equipment take care of receiving simultaneous alarms from different circuits.

The Fire Alarm Bureau is under the supervision of Chief Sidney A. Middleton. Robert I. Parham is the Superintendent of Fire Alarms, and is responsible for the care and operation of the fire alarm system—the nerve center of the fire department. The entire equipment was furnished by the Gamewell Fire Alarm Telegraph Company, Newton Upper Falls, Mass.

A fire alarm bell is a gigantic cash register, and every time it rings it means that someone has issued another paid-out ticket.

Get rid of that pile of rubbish *to-day*. Every rubbish pile is a potential conflagration.



By Herbert B. Larner, S. B.

Health Officer, Montclair, N. J.

THE proper education of the public in matters pertaining to health is recognized as a problem of such extreme difficulty and magnitude that it is not at all surprising that unusual methods are sometimes adopted to arouse the interest of an apathetic public. Whether health education should be under the supervision of boards of health or boards of education is a mooted question, but there is very little doubt that a solution highly satisfactory to all concerned was arrived at in Montclair when the Board of Health, the Board of Education, the local Red Cross chapter, the Y. M. C. A., and fifteen other agencies interested in health work cooperated in the successful staging of a Health Promotion Week, which was somewhat unique in its setting.

Its aim, of course, was to place before the public by means of exhibits and demonstrations information concerning the character and scope of the work done by the various organizations participating, and by means of lectures and motion pictures to consider special health problems pertinent to the occasion.

The problem of finding a suitable auditorium for lectures, having in conjunction with it a hall for exhibits, was the first to engage attention, and its unsatisfactory solution forced us to a consideration of the advisability of using circus tents. It was believed that their use would attract a far greater number of people than would be the case if an auditorium and a hall were utilized, the assumption being that the unusual spectacle of circus tents in town would have a powerful attracting influence on many people, who would attend the lec-

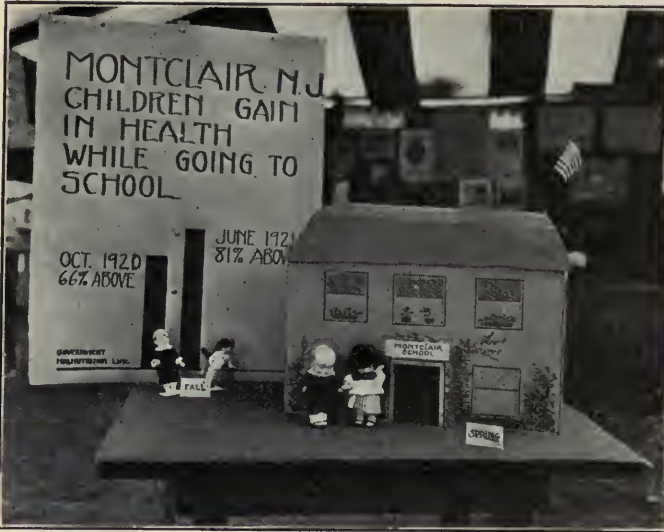
tures and view the exhibits out of mere curiosity, if for no other reason.

That this belief was well founded is attested by the fact that an estimated attendance of 5,000 was recorded at the exhibit tent, and approximately 1,500 people attended the lectures, in spite of the fact that the weather was not as satisfactory as could be desired.

Reaching the Children

The large number of children who visited the exhibits was particularly gratifying, and, since it is quite generally agreed that health education should begin during the early school age, emphasizes the fact that in arranging such exhibits particular care should be taken that they be of such character that their significance can be readily grasped by young children. So far as the older people were concerned, perhaps the most striking thing about the exhibits was the realization of the existence of such a large number of organizations functioning in greater or lesser degrees as unofficial health agencies. Each organization in its exhibit strove to demonstrate the scope and character of that branch of health work in which it was particularly interested, and there is little doubt that as a result of the campaign a far more intelligent and sympathetic understanding on the part of many people toward the work of the various organizations will result.

The speakers included for the most part men and women of national reputation in public health work, and, while the attendance at most of the lectures was satisfactory, at a few the results were somewhat disappointing. Particularly was this the



THE SCHOOL EXHIBIT AT THE MONTCLAIR HEALTH WEEK EXPOSITION

case with the lectures on social hygiene, but whether this was on account of lack of publicity in the proper places, or because of a saturated condition of the public mind due to so much propaganda on venereal diseases during the war period, is a question.

A large number of motion picture films were used in connection with the program, and we found that a picture would frequently attract a large audience, while a speaker of national reputation would sometimes fail to draw the number of people that he deserved. There can be no doubt of the effectiveness and attractiveness of motion pictures as a means of presenting health matters to the public, but at the present time probably 75 per cent of the health pictures in existence are of little real value as educational material and had better be discarded in the best interests of the work.

By far the most encouraging feature of the entire campaign was the great interest shown by the school children. Each afternoon, after school hours, hundreds of chil-

dren crowded the tents, frequently in groups, with adults to interpret the various exhibits for them. After all, it is the children—the men and women of to-morrow—who are the logical candidates for health education, and the logical place for such instruction is in the public school. When every public school system contains a well-established department of health education directed by a competent instructor, we shall then have made a start that will really amount to something.

In commenting on Montclair's Health Week

editorially, the *Newark Star-Eagle* said:

"Being on the slopes of the Orange mountains and possessing a good water-supply and an adequate sewerage system, Montclair scarcely would be considered a municipality in need of a health campaign. Nevertheless, the town has just closed a Health Promotion Week, the progress of which aroused the interest of the residents.

"The significance of the event in the suburbs lies in the word 'promotion.' The campaign was not primarily one to ward off the ravages of a particular scourge or epidemic, but rather was a general undertaking to improve the hygienic conditions already good.

"As such, the observance of this week marked a distinct advance over the usual short-sighted policy of not discussing health problems until the community is visited by a serious epidemic. Moreover, this project in Montclair was not concerned with the negative function of curing maladies, but with the positive purpose of building up the body to withstand disease germs.

"It was the social aspect of the problem which was emphasized in Montclair's Health Week, and for that reason the event was important in the annals of the town. Certain conditions must obtain to give the impetus for good health unimpeded room for development and fruition. Montclair has done well to call attention to these facts."

Law versus Education in Public Health

You cannot make a man moral nor clean by law; you cannot do away with contagious disease by law; you must secure cooperation by the individual, and this is obtained only by enlightenment and appeal to common sense.

Production, Not Reconstruction, the Order of the Day in Germany

Housing and Town Planning Notes of a Visit in October, 1921

By Stephen Child

Fellow, American Society of Landscape Architects

EDITORIAL NOTE—*In this article our readers will find some startling evidence of the manner in which Germany is building vast domestic improvements and thousands of houses, which will give her an advantage in the industrial competition with her former adversaries, who have been trying to conduct their post-war business on a more conservative financial basis.*

DURING the summer of 1921 the writer was again in Belgium in the interests of the "International Clearing-House of Civic Information."* Toward the close of his visit he was invited to join a party of Belgian municipal officials upon a "voyage de renseignement," this time into Germany, supplementing visits of other years in Holland† and England.

The first stop was at Cologne, where, across the square from the railroad station, it will be remembered, is the great "Dom." After viewing ruined Rheims, and with the devastation of France and Belgium vividly in mind, to see this cathedral unharmed and to note the marked evidences of rapidly returning productivity, if not genuine prosperity—the thoroughly up-to-date Rhine water-front with its docks and quays all busily employed, and its attractive tree-lined embankments—made one feel the startling contrast. There were many in the party who were thoroughly pleased to see the British flag flying from the roof of a great hotel, and over the entrance the words, "Headquarters British Army of the Rhine," and, as we toured the city later, to see many "Tommys" in full war regalia—a conquered city in everything but evidences of destruction.

In and about Cologne we visited twenty different housing projects, some of which were of great size, and these house-building activities were by no means the only construction going on. At Cologne, at Düsseldorf and Essen, and in many places between, there was evidence of enormous con-

structive effort—new or enlarged factories of every sort, new public or quasi-public buildings, new bridges, improvements in highways and street railway construction, and, most particularly, in the steam railroads. The outstanding fact noted throughout our Germany journey was that these people were all feverishly at work, not restoring, but producing. We were told on reliable authority that there were not 50,000 idle men in all Germany, and that on the pay-rolls of the Government-owned railroads there were 600,000 more men than before the war, a statement not to be doubted in view of what follows.

A few miles outside of Cologne, for example, enormous new railroad facilities were building, acres and acres of new freight yards and shops. We noted the grade crossings abolished at great cost. Adjacent to all of this a new garden city, Gremberger, is springing up. Plans under way called for 3,000 new houses or lodgings, over 700 of which were either finished or well along toward completion. The architecture is heavy, not particularly German in character, and quite uninteresting. Most of the houses are in rows of from six to ten. No dwellings are over two and one-half stories, many are but one and one-half, but some of the hotel and semi-public buildings are three stories.

As to prices and rents, it is difficult, in view of the fluctuations and fictitious values of the mark, to convert these to an American basis. We learned, however, that these six- and seven-room lodgings were to rent at from 15,000 to 21,000 marks a year. With the mark then, October 16, 1921, at three-fourths of one cent, this was from \$10

*See THE AMERICAN CITY, April, 1922, page 348.

†The Holland trip was described in THE AMERICAN CITY for February, 1922, page 103.

to \$12 a month. But they figured a mark to be worth twice this, or more, which would be a rental of from \$20 to \$30 a month of our money. Furthermore, the Government in one way or another advances three-fourths of the cost at 2 per cent, details varying in different places, sometimes as here through the state railroad, elsewhere through municipal or Government loans to cooperative and building societies. Contrast with this, that in Belgium the Government advances but one-fifth to such societies, and at 5 per cent or 6 per cent.

Among these Cologne projects we saw one then nearing completion, perhaps a hundred really expensive homes, mostly single houses of large size, eight to twelve rooms, a few, however, in rows, all a very heavy, ugly type of architecture, but all with the most approved modern conveniences. All had ample front and rear yards, and in most cases faced either squares or broad parked avenues. Evidently no expense had been spared. Such dwellings in America would cost not less than \$25,000 each, and Germany was building them for retired army officers!

Ten or fifteen miles southwest of Cologne is a more hilly region, in the midst of which there are, near the surface, enormous deposits of the so-called "brown coal" (lignite), a poor-grade fuel, for which there is a large demand. The material is excavated by steam shovels or by hand, removed by small trains to near-by works, and pressed into oval briquettes about the size of a large egg. About these "mines" a number of villages have grown up, the dis-



PORTION OF ONE OF THE MANY HOUSING PROJECTS NEAR COLOGNE

This one was built during the Great War

trict being known as Bruhl. Here there was also great housing activity, with about 1,000 houses or lodgings in process of construction, to help stabilize the labor supply. The situations for these homes were well chosen, usually half a mile or more (but within walking distance) from the mines, some on sloping hillsides having a fine view of the city and the Rhine Valley. All of our party noted the intense industrial activity evidenced by the many hundred factory chimneys in this Cologne district, all sending forth clouds of smoke.

Leaving Cologne next morning by auto and crossing to the right bank of the Rhine, we passed first through an older, uninteresting, but intensively active, industrial center, Mulheim, with many overcrowded, old-type tenements, but with some new construction on the outskirts; then on into a rich farming district, with every evidence of thrift and productivity. Long hours of steady, hard labor seemed to be expected everywhere in mine, factory and farm.

About half-way between Cologne and Düsseldorf, in the center of a beautiful, quite rugged and well-wooded country, is the district of Bergisch-Gladbach, the Dalton and Pittsfield of Germany, the center of the fine paper-making industry. In 1895 one of the wealthy manufacturers built here on the outskirts perhaps the first real garden city,—certainly the first in Germany, and in many respects the most interesting,—called "Grönauerwald." Two Munich architects were the designers of the town and its first buildings, and it is certainly all quite idyllic. Several hundred cottage homes were built at the beginning of the



HOUSING AND TOWN PLANNING AT DUSSELDORF—PORTION OF BOULEVARD SYSTEM

Note car-tracks on outer edge of central planting strip

development, and little was done thereafter for several years. But in October there was considerable building activity at this place, mostly houses in rows of from six to ten. There, as elsewhere, the Government furnished three-fourths of the amount necessary, the remaining fourth being raised by local interests. It is upon this one-fourth only that rentals are based, a most uneconomic basis.

From pretty Grönauerwald we motored on in the afternoon again through prosperous-looking farms and frequent small manufacturing centers, like Opladen, Denrath and Wiesdorp. These towns all seemed characteristically well ordered and neat, the various plants all extremely busy and no idle men in evidence. The workmen's homes, most of them detached cottages in fair-sized lots, were of varied architecture and, thanks to the generous interest of the mill owners, all gave many evidences of liberal expenditure and quite luxurious appointments, considering the character of the occupants.

At Denrath a fine chateau near the town's center, with beautiful grounds, gardens and lake, all in the French style, once the property of an old noble family now fallen upon

evil days and unable to maintain it, had passed into public ownership;—the townspeople had enough money to buy it, and it is now a public park, the mansion a community house.

Wiesdorp, just mentioned, is one of the important centers of the German aniline dye industry and is an especially prosperous-looking community, with hundreds of modern houses, mostly in rows, and apparently built during the war or since. Thus, while Germany was destroying homes in Belgium and France she was building them in her own country.

Düsseldorf is a more attractive city than Cologne, though not so large. It has a beautiful Hofgarten and fine buildings, and every evidence of prosperity. We were driven about town, saw the attractive and extremely well-appointed Rhine waterfront, much of it parked and lined with tree-shaded promenades and boulevards, the busy "Hafen" full of shipping, and on the outskirts of the town the fine boulevard system. Here we noted with pleasure many evidences of French Army occupation.

We visited six or eight quite large new housing schemes in various degrees of progress and then went on by auto toward



MARGARETENHOHE, THE MARKET-PLACE AND THE FOUNTAIN OF THE "SCHATZGRABER,"
THE SEEKER AFTER TREASURES

An inscription reads, "Seek them in noble deeds"



THE OAK AND THE VILLAGE FORUM AT GRONAUERWALD GARDEN CITY, NEAR COLOGNE

Essen. This is a particularly attractive country, quite hilly, and, for much of the way, beautifully wooded. Again we passed prosperous-looking farms and busy towns, all of course quite undamaged by war.

A few miles beyond the little Socialist colony of Freiheit, in the picturesque, narrow, steep-sided valley of the Ruhr, is Kettwig, where there are large and prosperous woolen mills. Here, too, the workers were building their own homes, during their slack times and hours of leisure. By this method, we were told, it takes them, as a rule, about two years to build one of their small cottages. An architect has been secured for the cottage plans and for the supervision of construction, taking as his fee one of the small houses erected by the men from his own plans. Here, too, they must employ outside trades for part of the work. There has been developed both here and at Freiheit a remarkable esprit de corps, which has succeeded in overcoming many difficulties.

The Krupp Colonies

Essen, famed as the home of the Krupps and engines of war, lies also in the valley of the Ruhr, and the town is spreading out and up the hillsides of one of the minor branches of this river in all directions. All about on these hills are the shafts, works and culm piles of great coal mines, but the city is surprisingly clean. As we entered at nightfall, coming over the hills from Werden, the many chimneys of the enormous Krupp works were belching forth smoke

and flame. Next morning, although we were not permitted to enter the works, we drove in and out of many streets and ways lined with high walls and great mills, getting a good idea of the extent of the enterprise, and we became well aware that despite the war there was no lack of work here. "What are they making here now?" we asked, and the reply was: "Everything—locomotives, agricultural implements, sewing machines, typewriters, cameras and their parts."

There is a fine railroad station, and, near-by, excellent hotels. Not far away is the usual "Stadtgarten" with its great assembly hall, and near this an Art Museum. All about are many pretentious homes, built in the colossal, heavy type of architecture so much favored in Germany before the war. The great "Works" are not far away: in fact, they sprawl all over the level area of the lower town, with miles of railroad tracks entering the gates and winding about behind the walls and mills.

We were shown, first, the older tenement houses. Some of the first, built about fifty or sixty years ago, near the mills, are barrack-like stone buildings four or five stories high, blackened with smoke, each housing ten or twelve families. There is quite an open space about each structure, now shaded with trees. We then went on to the more pretentious, newer groups. Of these, Alfredshof includes, besides hundreds of row-houses, many large and imposing apartment buildings. But more attractive, and indeed more extensive, is the great

colony, "Margarethenhöhe," built some years ago by the second Krupp on the occasion of the marriage of his heir and daughter, Margaret. Here are hundreds of handsome homes for workmen, with many parks and public gardens. The civic center of the colony, called the "Markt," is paved in pattern, bordered by booths for market-day, and by shops, post office, public hall and other quasi-public buildings.

By far the most beautiful of all the Krupp colonies is Altenhof. Here is where employees who are incapacitated for further work, either by age or accident, are given a home for their declining years. The central feature of this project is a very beautiful valley park of perhaps fifty acres that adjoins or merges into the Stadt Wald of about five hundred acres. Through the smaller park flows a pretty brook, and the valley is laid out with skill and maintained with the utmost care. Here are open lawns, suitable paths, trees and shrubbery, but no garden bedding. On both sides are picturesque, winding, tree-shaded, narrow streets, bordered almost exclusively with detached houses, some of the most attractive cottage architecture the writer has ever seen anywhere. Each has an ample lot with pretty front yard and well-kept rear gardens. There are two chapels,—one a gem,—a group of little stores and the post office; all this for those having families. Then there are particularly beautiful groups of apartments, low structures two- and a half stories high built about lovely sheltered garden courts. Some of these are for single old men and others for single old women, and near-by there is a splendidly appointed hospital for the most decrepit and those more seriously ill.

We were shown, also, several other large housing projects in outlying parts of the town, then in progress or nearing completion, and were told that, notwithstanding the post-war decrease in the number of men employed at the Works, there was even then a serious housing shortage at Essen, which they were strenuously endeavoring to

meet. We noted also a real shortage in school accommodations. Many of the older school yards were partly filled with temporary school buildings. As we passed one of these groups at the noon hour, the boys 12 or 14 years of age, about 50 of them, were not at play, but drilling under the careful instruction of a young man, evidently a former officer.

What Does It Mean?

Surely enough has been said of the immense volume and variety of public and quasi-public improvements and productive activities then going on in Germany to make even those who have not seen any of it realize something of its magnitude and import. One may readily understand, too, some of the feelings of the members of our party, Belgian municipal and housing officials, architects, and engineers, struggling as they are at home against empty treasuries, cramped credits, high prices, criticism of all sorts, and labor troubles. Many times came the question, "How is it possible for this nation to do all this?" Finally one of our party, the able correspondent of *Le Soir*, one of Brussels' leading newspapers, frankly asked some such question of one of the business men, who was showing us about, and here is his reply: "We are not troubling ourselves about the future. We are spending money. We are piling up debts! What do we care!" This was the apparent sentiment all through the part of Germany that we visited, accompanied by an inordinate desire to make at once, while the opportunity was good, all possible internal improvements. To another of our party, a member of the City Council of Brussels, this reply was given: "We have about 200 billion marks of debts. Why should we not add thereto a new 100 billion, especially when it is a question of dwellings? The Allies will not be able to take those away from us."

NOTE.—Some conclusions, the results of Mr. Child's observations in regard to housing and town planning during the past two years not only in Germany, but in Belgium, Holland, France and England, will appear in THE AMERICAN CITY next month.

Wanted: "Before and After" Views

If some eyesore in your city is to be turned into a beauty-spot, or some antiquated public building is to be replaced by a modern one this summer, why not secure a photograph of existing conditions before the work is started, and a view from the same point after the improvement has been completed? Such photographs will be of historical value in your own city, and an inspiration to other communities to do likewise. THE AMERICAN CITY will be glad to publish occasional contrasting views of this kind.

Do Civil Service Rules Promote Efficiency?

No

TO THE EDITOR OF THE AMERICAN CITY:

My experience, covering 25 years in public life, has convinced me that no city can conduct its municipal business with the highest results and be hampered with civil service rules, any more than a private business establishment can make a success under such handicaps.

We have found in Jamestown that often the best applicant for policeman, fireman, lineman, etc., is found at the bottom of the civil service list while an inferior man is often found at the head of the list in percentage. There is no such thing as ascertaining the integrity or character of a man by any questionnaire system. This was shown the other day when Thomas Edison tried to get the best men for service in his works by submitting seventy-seven catch questions which even college graduates were unable to answer.

In the conduct of its many public utilities Jamestown has often found itself greatly handicapped in not being able to hire the best men or remove the inefficient because of the "red tape" imposed by civil service regulations. As a matter of fact, any system which makes retention in employment dependent upon the mere vested right a place holder is supposed to have in his job is not productive of that harmony, loyalty and discipline which are essential in any organization where business results are sought.

The manager of any concern, whether it is public or private, must be absolutely free to exercise his own judgment and his own knowledge of human nature in the selection of subordinates by practical, not theoretical, methods.

The result of forty years of civil service regulations in this country has failed to bring about that reform which civil service aimed to carry into effect. And it is the experience of every city manager that civil service rules are a hindrance rather than an aid in securing meritorious service.

All this talk about the spoils system and the creation of political machine rule, where the civil service rules are not in effect, is all bosh, because where there is an awakened public sentiment with absolutely fixed responsibility and adequate power vested in the governing authorities, there can be no danger of misrule unless the people themselves want that kind of rule. But, on the other hand, where the governing agency is handicapped, inadequately paid and stripped of proper authority and where there is no fixed responsibility, we get bad government and inefficiency, which is always the direct result of divided responsibility and unbusinesslike methods. It is limited authority to do things, that keeps big men out of office and leads to "cheap politics."

During the war civil service broke down completely because merit and results could not be obtained by any system of theoretical examinations.

There has never been a private business establishment conducted successfully by any system of civil service rules, and no city can run its affairs successfully by any such rules. There may be special branches of public service in the National Government where clerical knowledge may be ascertained in a measure by permitting the applicant to answer in his own way questions pertaining to his qualifications before he is accepted in the service. But when the applicant has answered correctly or explained satisfactorily his knowledge of the duties pertaining to the position for which he is an applicant, the appointing official should be free to select from any name on the eligible list, regardless of any percentage or whether the applicant is among the three highest or three lowest on the list. When we make civil service practical, it will be a success, and not until then.

And when the American people eliminate partisanship from municipal service in peace time, as they eliminated partisanship from national service in war time, they will pave the way for ideal government and real democracy.

SAMUEL A. CARLSON,
Mayor, Jamestown, N. Y.

Yes

TO THE EDITOR OF THE AMERICAN CITY:

A categorical denial of Mayor Carlson's assertion that the civil service system is a failure is hardly sufficient. His experience, covering, as he says, 25 years in public life, has led him to a conclusion which is interesting in contrast to the opinions of many other public officials in New York State of equally long experience. For example, Grover Cleveland, after he had been Governor of New York, said:

"I am, if possible, more than ever convinced of the incalculable benefits conferred by the civil service law, not only in its effects upon the public service, but also, what is even more important, in its effect in elevating the tone of political life generally."

Charles E. Hughes, also, after having served as the Chief Executive of New York State, said in speaking of the civil service clause in the state constitution:

"... There is no clause in the constitution which is of greater importance to the maintenance of high standards of administration than that clause, the full scope and meaning of which have not yet been fully determined by the courts, but are destined to be in time. . . . We have nothing more important in relation to the administration of government than a system—the best that has yet been devised—of securing men of the needed capacity by competitive examinations wherever such examinations are practicable. I believe in that, I thoroughly endorse it, and I hope to see it extended throughout the states of the Union."

The rules and regulations governing employment in successful private corporations are analogous to the civil service laws of states and cities, and while it is not fair to compare private employment to employment in the civil service, the principles underlying the two systems are the same. However, to take persons from eligible lists for civil service positions, without regard to their relative standing on the list, would be fatal to the merit system. The principal reason for the existence of our civil service laws is to counteract the constant pressure of the spoils system. To select persons from eligible lists regardless of relative fitness as shown by competitive examination is nothing more nor less than a pass examination system and is little better than the spoils system in all its glory. The pass examination for the civil service, except for labor classes, has, wherever tried, proved a miserable failure. Even the present provision of many civil service laws for the selection of one out of the first three on an eligible list often gives opportunity for political influence to control the appointment. We have had ample demonstration of this in the examinations conducted throughout the country for the selection of postmasters. Here politics seem to have controlled in the vast majority of selections, and this is what might be expected in every case where a mere pass examination is held.

I do not contend that the competitive examination system is infallible. On the contrary, I am one of the first to recognize the various points in which there is room for improvement. However, until some better means of selecting public servants is proposed, it should, and will, I believe, be retained.

A return to the spoils system is inconceivable. The spectacle we have had during the past two years of the kind of men secured under the spoils system for prohibition enforcement agents is enough to demonstrate the futility of attempting to select public employees by any other method yet devised than by up-to-date competitive examination.

H. W. MARSH,
Secretary, National Civil Service Reform League.

The Editors of THE AMERICAN CITY will welcome expressions of opinion on the following questions:

1. Do civil service rules promote efficiency?
2. Within what city population limits are civil service rules most effective?
3. To what extent do civil service rules help or hamper a city manager?
4. How can civil service commissions help city administrations?

A New Form of Expansion Joint for Reinforced Concrete Pipes

By Walter C. Parmley

Consulting Engineer, New York City

THE expanding use of reinforced concrete pipes for conduits, sewers and pipe lines generally where a minimum amount of leakage is demanded makes the question of an economical and effective pipe joint one of increasing importance. It has been abundantly demonstrated that reinforced concrete pipes can be built to withstand pressures up to 100 feet of static head, and examples of still greater pressures can be cited.

The problem of leakage consists essentially of two parts: first, the conditions necessary to reduce leakage in the barrel of the pipe to a minimum; and second, to discover a form of joint between the different pipe sections which will remain practically water-tight under all conditions in actual service. Assuming that we have pipe

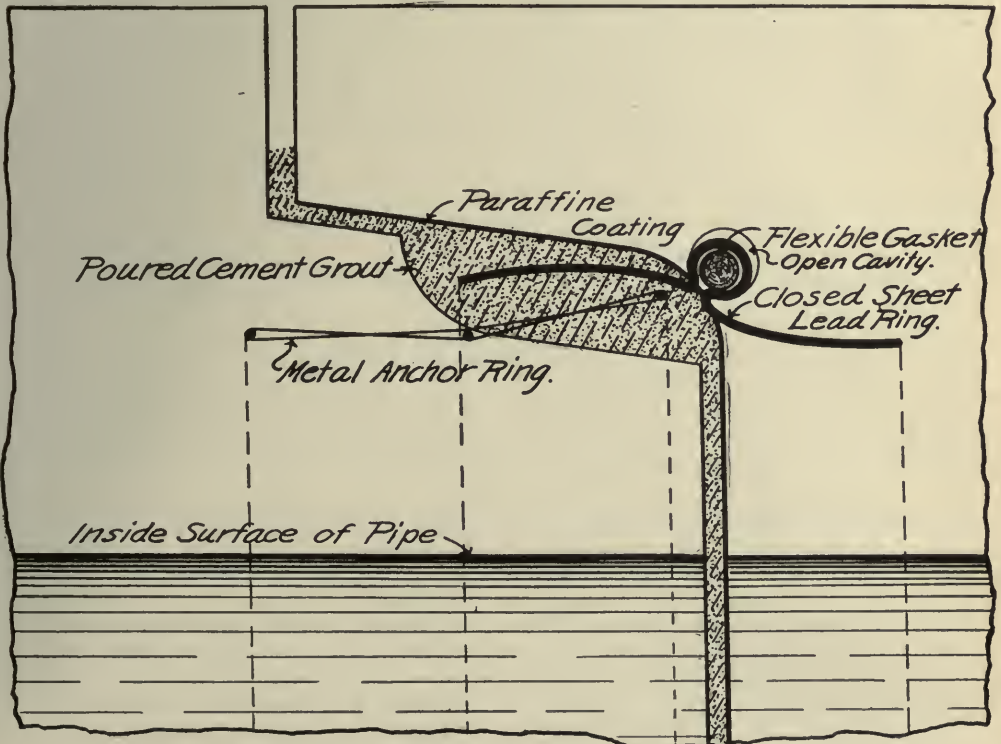
sections of sufficient strength and imperviousness, the following are some of the essentials for a water-tight joint:

First—The joint must be simple and practical in design, so that it can be made water-tight with reasonable certainty by ordinary laborers available for the work. That is to say, the different parts must have such relationship to each other that the mortar, grout or material used to seal the joint can be easily and effectively placed, and all the inner cavities completely filled with dense, impervious material.

Second—The material of the joint must be practically imperishable and unchanging in physical constitution, and unaffected by contact with water.

Third—A water-tight contact surface or bridge must be effected between the mass of the joint material and the ends of the pipe sections, so that water cannot pass along this junction.

Fourth—The joint must have some form of



A CONCRETE PIPE JOINT WITH NEW FEATURES

provision to permit expansion and contraction of the different pipe sections without danger of breaking the water-tight contacts at the joints. The variations between the maximum and minimum temperatures to which a pipe line may be subjected may easily exceed 100 degrees F., that is to say, the change in length due to changes in temperature of a pipe line one mile long may easily amount to $3\frac{1}{2}$ feet. Obviously, this change must be taken up in numerous joints and not accumulated in a few places only. Where a pipe line is embedded in the earth, unless these expansion and contraction joints are numerous the body of the pipe will be broken, so great becomes the resistance of the earth against an end-slipping tendency of the pipes.

Fifth—The joint must permit a certain amount of shear effect or inequality of settlement of the successive pipe sections without breaking the water-tight character of the joint. The serious effects of such weakness in contraction joints have been observed by the writer where otherwise the joints were presumably effective.

The illustration shows a section of a new form of flexible contraction joint which is designed to fulfill the conditions above enumerated. The pipe sections are essentially of the bell-and-spigot type, but the form of the spigot is modified so as to permit the spigot to close up against the bottom of the bell along the inside of the pipe. The outside surface of the spigot at its base and the inside surface of the bell near its outer end are made to fit closely, and there is thus left an inner blind groove for subsequent filling with grout material, usually poured through a grout hole left in the bell of the pipe at the top, after the inside of the joint has been pointed up with mortar. This form of spigot-and-bell pipe has been used on pressure pipes for some years, but if no further feature is added, a contraction or settlement of the pipe line may cause the joint to spring a leak. To prevent this difficulty, it is now proposed to insert in the bell end of the pipe section a ring of lead, or copper sheet metal—preferably lead—formed into a complete ring with soldered ends and molded into the bell end of the pipe. The peculiarity of this ring is that it is shaped so that there is a fold in the metal extending around the entire circumference of the ring. This roll or fold is brought down close at the throat, and one edge of the sheet metal ring is shaped so as to conform to, and lie flat against, the upper surface of the cast iron base ring that forms the bell end of the pipe.

The concrete can now be poured and the

pipe section completed so as to embed the upper edge of the metal ring, and the concrete will not enter the folded portion of the ring. After the pipe has hardened, the edge of the ring which lies flat against the inner surface of the bell is pulled out into the position shown in the figure. This edge later becomes embedded in the mortar of the joint, as shown.

In the process of pulling the metal into the position shown, the rounded part which lies back in the body of the pipe is detached and pulled loose from contact and thus becomes free thereafter to come and go within a self-made circular pocket extending annularly around the entire body of the pipe. This is shown in the illustration.

If the inside of the bell is painted with paraffine or asphalt, there will be little or no adhesion between the grout of the joint and the concrete of the bell end of the pipe, and the lead ring becomes permanently anchored in the joint material along one edge and in the solid body of the pipe along the opposite side of the contact surface between the two. The lead sheet is thus free to come and go easily with contraction and expansion movements without breaking the continuous metal bridge across the joint.

To prevent the possibility of cleavage along the contact surface between the spigot and the grout filling of the joint, a hoop of metal mesh may be molded in the spigot end of the pipe, projecting into the joint space and anchored in the grout, as indicated.

To further facilitate the molding of the pipe and prevent any possibility of getting grout into the fold in the metal ring when the pipe is poured, a gasket ring can be formed into this fold when it is rolled. This gasket or rope of elastic material serves as a cushion against which the metal can work. With the rolled rounded shape of the metal, as shown, molded in the body of the pipe at the bell end, it is obvious that the two sections of pipe can be separated a considerable distance without endangering the continuity of the metal water-stop that bridges the gap. By the avoidance of any sharp crimps or folds of the metal, all danger of the metal's cracking along the line of the bend is prevented, and the metal can work back and forth an indefinite number of times without danger of cracking.

It is specially to be noted, particularly if sheet lead is used, that shearing effect or side-slipping of the sections can be permitted without danger of cracking the metal and so breaking the water-tightness of the joint. By making a joint of such design that it will accommodate a certain amount of transverse displacement, it is believed that additional safety is added to any joint

that provides only for expansion and contraction movements.

The form of joint shown is not limited to concrete pipes, but can be used to join old and new work in walls, floors, etc. Full-size sections of such joints have been made and may actually be separated by amounts as great as a half-inch without endangering the effectiveness of the metal water-stop.

County Engineers' Salaries and County Road Expenditures

An Idaho County Shows Striking Inconsistencies

IN its country-wide investigation of the salaries of municipal and county officials, THE AMERICAN CITY has come across some instances of salaries which seem disproportionately low for the character and quality of the work performed. Unfortunately, these low salaries are of quite frequent occurrence.

In examining the annual report of a county in Idaho, it is found that the maximum salary of the County Surveyor, who does all of the engineering work for the county, is \$800 per year. It requires an act of Legislature to raise this salary; consequently it has not been changed in the last ten years.

The 1919 Annual Report of this county shows the sum of \$74,285.35 expended on county roads for that year. The total for county bridges was \$61,658.69, making a total of \$135,944.04 for the road and bridge fund. The total expense of the Surveyor's office during the same year was: salary, \$799.92; stationery and supplies, \$53.16; clerical assistance, \$750; miscellaneous expenses, \$148.82; making a grand total of \$1,751.90. Attention is called particularly to the salary as compared with the sum spent for clerical assistance.

In the Annual Report of 1920 for the same county, the money expended on county roads was \$103,788.36; on county bridges, \$23,207.82; making a total of \$126,996.18 for roads and bridges. The County Surveyor's expenses for the office for the same year were: salary, \$889.92; stationery and supplies, \$30.34; clerical assistance, \$900; furniture, \$96; miscellaneous expenses, \$153.48, making a total of \$1,974.70. It is

interesting to note that in this year the sum for clerical assistance was actually a few cents more than the salary of the County Surveyor, who is the engineer and executive.

A careful examination of these figures shows that there is a rather sad discrepancy in the proportion of salary to expenses in the Surveyor's office, and since the Surveyor does all of the engineering work for the county, his salary is exceedingly small in proportion to the money expended. The total area of this county is about one million acres, one-half of which is national forest. Of the land outside of the forest, 50,000 acres are classified as grazing land, and 250,000 acres are classified as suitable for agricultural purposes. The county lies in the heart of the mountain district, so that all the surveying and the engineering work pertaining to the location of roads and their construction are quite expensive.

If the county were located in a prairie country where surveying was simply a matter of running lines, the salary of \$800 a year might be adequate, but if the work takes the engineering party into mountainous districts and timber where locations are difficult, added salary is justified.

Due consideration should be given to the climate and topography of a county when adjusting salaries for county surveyors and engineers. The arduous labor and technical matters connected with the surveying and laying out of roads in mountainous districts call for a compensation greater than for an engineer who simply has to run a comparatively easy line on level, rolling prairie land.

A "Safety First" Bridge

County Assumes 85 Per Cent of Cost of Building New Concrete Arch Bridge

By C. M. Niles

THE use of speedy pleasure cars and heavy motor trucks on improved roads necessitates careful attention to the safety of highway bridges and approaches. A fine improvement of this kind has recently been completed near Rome, N. Y., where the main east-and-west highway crosses Nine Mile Creek.

The highway was straightened and widened, as was also the bed of the creek above the bridge. It was necessary to build a long concrete retaining wall to protect the relocated highway from the wash of the stream.

The bridge was built by contract in quick time. Each arch has a span of 60 feet and



BUILDING THE NEW CONCRETE BRIDGE AT ROME, N. Y.

Position of old abutment shows how the alignment was changed to eliminate dangerous curves

At this point the stream was formerly spanned by an obsolete iron bridge with plank flooring. There was a sharp, dangerous curve at each end of the bridge, which was known to motorists as a death-trap. Fully a score of automobile accidents occurred here, several of them resulting fatally. Strangely enough, after carrying innumerable heavy loads, the old trusses suddenly buckled while a light machine was crossing the bridge, and the whole structure collapsed into the creek.

The local highway authorities have erected a modern two-span concrete arch bridge to replace the fallen structure. The alignment of the bridge was changed so as to eliminate the dangerous curve at each

rises 12 feet above normal water-level. The concrete is reinforced throughout with steel bars of various sizes. The main arches are over a foot thick. Each arch was moulded in two equal longitudinal sections, the concrete being poured continuously from start to finish of a section. The whole structure is crowned with a panel parapet railing of concrete.

The cost of the improvement was approximately \$25,000. This would ordinarily be a town charge, but the town of Marcy has a small assessed valuation and was unable to bear the entire burden. So, to insure the work's being done in the best possible manner, the county of Oneida assumed 85 per cent of the expense.

Forward Steps in Municipal Affairs

Mayors

Municipal Shops Reduce H. C. L.

TIFFIN, OHIO.—By an active campaign the administration of this city has been able materially to reduce retail food prices, to the great benefit of consumers.

The first step was to learn the facts. These were obtained, in part, from the Bureau of Markets and Crop Estimates of the United States Department of Agriculture. It was learned that whereas the peak price of live steers, good to choice, dropped from 17.5 cents in 1919 to 8.88 cents in October, 1921, and that the price of these same steers (live) dropped from 23.3 per cent in 1919 to 16.44 per cent in October, 1921, the rise in per cent of the price of wholesale beef over that of live steers was from 133.1 per cent in 1919 to 185.1 per cent in October, 1921. Meanwhile the per cent of price of sirloin steak over that of

live steers rose from 238.3 per cent in 1919 to 421.2 per cent in October, 1921, and the per cent of price of chuck roast over the price of live steers rose in the same period from 154.3 per cent to 224.1 per cent. Such figures seemed to justify a thoroughgoing probe of retail meat prices. This developed the apparent existence of price-fixing agreements among local butchers, and also the fact that cows were being sold at steer beef prices and that in some instances meat from diseased cattle had been sold. At the conclusion of the probe, but without the necessity of prosecution, retail meat prices in the city of Tiffin dropped from 20 to 60 per cent.

The question of bread prices was next taken up. The enormous decline in flour prices seemed to justify a demand for cheaper bread. The bakers, however, refused to sell a 16-ounce loaf for 7 cents or a 24-ounce loaf for 10 cents. The administration accordingly entered into an agreement with an out-of-town concern for a supply of bread costing 5 cents for a 16-ounce loaf, which was sold at the fire sta-



THE CITIZENS OF TIFFIN, OHIO, BACK UP THEIR MAYOR'S CAMPAIGN FOR LOWER-PRICED BREAD

tions. The first day, 500 loaves were sold in 45 minutes, with the demand unsatisfied. Owing to pressure on the supplying company, this source was shut off after the first day. Thereupon a new source was discovered, which enabled the municipality to supply bread, delivered at homes, for 10 cents the 24-ounce loaf. In less than three weeks, a local bakery accepted the terms originally proposed, and this has brought the other bakers to time.

Milk had been selling at 12 cents the quart, 2 cents higher than in some neighboring towns. But the effectiveness of the bread and meat campaigns persuaded the dairies to drop their prices.

It will be noted that in these campaigns there have been no prosecutions of any sort. The weapon upon which the greatest reliance has been placed has been publicity.

ADOLPH UNGER,
Mayor.

residence, business house, hotel, wagon-yard, elevator and mill to collect rubbish and trash and haul it to the dumping-ground. Twice a month he visits the outdoor closets and hauls their contents away.

The cost of maintaining this service is met by a series of fees, which are explained in detail on the accompanying bill. The 20 per cent penalty insures prompt payment. Responsibility for collections rests with the City Clerk, who adds this to his other duties.

F. L. YARGER,
City Clerk.

Recreation Departments

Pick-and-Shovel Golf

SACRAMENTO, CALIF.—This city recently had a Pick and Shovel Day at the municipal golf links, on the "Tom Sawyer" plan. No one has asked who originated, and no one desires credit for, the bright idea of getting together lawyers, bank clerks, automobile salesmen, life insurance agents, and others to put in a day's hard labor in remodelling the municipal golf links.

The plan worked admirably. A meeting was called at the City Hall. At this meeting it was determined that the work be done by volunteers; that F. N. Evans, Superintendent of Parks, together with the Greens' Committee, figure out the changes to be made on the links; that W. G. McMillan, the State Purchasing Agent, secure from the State Highway Commission 60 shovels, 10 wheelbarrows, 10 mattocks, 10 picks, and 10 tamperers; and that C. S. Armstrong, of the Western Pacific Railroad, get some water buckets and tin cups.

The hour set to begin the work was 8:30 A. M. and most of the "boys" were on the job. There were one or two "flat tire" excuses, but for the most part the golfers were on time.

The work had been planned and laid out at the links the day previous, and squad captains had been assigned to certain pieces of work known as Job No. 1, Job No. 2, Job No. 3, etc.

If any one thinks that a "bunch" of golfers cannot put a

Health Departments

Every Week Is Clean-up Week in This City

MADILL, OKLA.—This city has an ordinance under which it has been very successful in keeping cleaned up fifty-two weeks in the year. The City Clerk is charged with the duty of keeping the plan effective.

The city employs a man at \$150 per month for himself, team and wagon. This man makes daily rounds, visiting every

ORIGINAL

Sanitary Ser. No. I. L. P. 1881

No. 983

SANITARY BILL FOR SANITARY AND MATERIAL MONTH OF Feb 1922

This bill is due on the first and must be paid on or before the tenth of the month or 25 per cent late added

PRICES FOR SANITARY WORK

Residence Without Privy	25cents	
Residence With Privy.....	50cents	
Boarding Houses, Hotels and Restaurants Without Privy	\$ 1.00	
Boarding Houses, Hotels and Restaurants With Privy	2.00	
Business Houses Without Privy.....	50cents	
Business Houses With Privy	1.00	
Wagon Yards, Gins, Elevators and Oil Mill Without Privy	1.00	
Wagon Yards, Gins, Elevators and Oil Mill With Privy	5.00	
For Extra Work.....		

20% Delinquent Fee \$ _____ TOTAL 30

Madill, Okla. 3-18-22

M. J. W. Clinton
Madill, Oklahoma

To: MADILL SANITARY DEPARTMENT, Dr.

By: F. L. Yarger City Clerk

BRING THIS BILL

EVERYBODY GETS HIS SANITARY WORK DONE AND
PAYS FOR IT IN MADILL, OKLA.

job over, he is mistaken. When the dinner bell rang, about two-thirds of the work outlined had been finished. At the club house each golfer relished his platter o' beans, coffee, bread, butter, and cake, and after a short smoke took after the shovel again. By 3:30 P. M. the work was completed, and many golfers played over the course the same day.

Fifty-two men and two women volunteered for service. Mrs. L. F. Sherwood wielded a long-handled, round-pointed shovel along with the men, while Mrs. F. H. Webster acted as registrar, time-keeper and water-boy.

It was estimated that \$250 was saved to the city. The golf course was changed to suit the golfers. The workers are still talking about what a good time they had, and that each has himself to blame if he gets caught in a deep trap, or stopped by a high bunker, for he himself was particeps criminis to the job.

GEORGE SIM,
Superintendent of Recreation.

Something New in Polling Booths

NEWARK, OHIO.—This city has found a new use for polling booths between elections. They make fine bath-houses.

The most available swimming hole for the people of Newark is about a mile from the town, near the pumping station. Just below the dam, however, there is a first rate swimming place, but there were no suitable bath-house accommodations anywhere in the neighborhood. An attempt was made to raise funds for the erection of a bath-house, but it proved unsuccessful. Then the idea was hit upon of rolling two portable election booths to the site, building a little platform between, and a stairway leading down to the water's edge. The booths are made of metal, measuring about 10 by 18 feet, and mounted on wheels, so that it is a simple matter to transport them to and from their summer location. One of the buildings is used for men and boys, the other for women and girls. The former has no partitions, but in the latter the frames and canvas which divide the booths for vot-

ing purposes were retained as partitions. These booths were made by the Kelsey Paving and Construction Company of this city.

There is a fee of ten cents for the use of the bath-house, and every patron is provided with a split basket in which to place his clothes in charge of the caretaker. A man is always in charge of the place, and the fact that he saved a boy's life soon after the booths were set up convinced people that since this scheme involves supervision, it is well worth while.

W. I. LEWIS,
Manager, Newark Chamber of Commerce.

Park Departments

Harrisburg's Municipal Bathing-Beach

HARRISBURG, PA.—Situated along the banks of the Susquehanna River, five miles below the gap where it breaks through the mountains and spreads out into a beautiful valley, Harrisburg, Pa., has unusual water facilities.

The water-front has been kept free from any kind of buildings, giving an unobstructed view of the river, dotted here and there with low-lying islands; for the strip of ground between Front Street and the extreme edge of the bank, extending the entire length of the town, is a city park, where all can enjoy the beauty of the scenery and the coolness of the breeze from the water. Opposite the city is an island that for years has been used for park purposes. Here are baseball diamonds, running track and tennis courts, and for some time past a bathing



A NEW USE FOUND FOR POLLING BOOTHS, NEWARK, OHIO



HARRISBURG'S MUNICIPAL BATHING-BEACH

place has been maintained on the extreme lower point. A small wooden building, containing lockers, provided accommodations for the bathers. At the upper end of the city, along the river shore, another such bath-house was located, but both of these were inadequate and primitive.

At the election in November, 1918, in response to the growing demand, the floating of a loan for \$40,000 was voted on, for the erection of a concrete bath-house and the establishment of a municipal bathing-beach. On June 20, 1921, the building was completed and thrown open to the public.

This attractive-looking concrete bath-house is equipped with dressing-rooms, lockers, shower-baths, drinking-fountain, telephone and electric light. One side is set aside for men, and the other for women. Outside, at either end of the building, are stationary wringers for the bathers to use in wringing out their suits, after dressing. A board walk from the common central door forms the runway to the water.

There is no charge for swimming privileges, and swimming suits are supplied for the bathers at a nominal fee, except to small children, who may use them without charge. A concession has been given for a refreshment stand.

The surprise has come in the number of people who frequent the beach. Thousands come daily, and the bath-house from the first was taxed to its capacity. Soon it became necessary to erect auxiliary tents to take care of the overflow. These in turn have been filled.

Many problems have arisen in the administration. The first serious one was the discovery that different people were complaining of lacerated feet. While the bed of the river is rocky, it was soon found that the cause came from pieces of glass. Careless people buying bottles of "pop" had

broken the bottles and thrown the pieces into the water. A restriction at the refreshment stand, that no bottles could be removed from the stand, eliminated a great percentage of the accidents. Playing ball on the beach or in the water, while an enjoyable sport, was also prohibited, as many people were accidentally hit by the balls, and in some cases painful injuries were sustained. All this led to the establishment of a "first aid" tent where a trained nurse presides and gives treatment to all who apply.

In addition, life-guards watch over the safety of the bathers, and a pulmotor has been installed in the first-aid tent for the resuscitation of people rescued from drowning. Every care has been taken to safeguard the lives of the bathers.

As time passes and experience shows the need, additional improvements will be made, but even now the municipal beach is a most popular venture.

EDWARD Z. GROSS,
Superintendent of Parks and Public Property.

Libraries

St. Louis Public Library's Municipal Exhibit

ST. LOUIS, Mo.—A comprehensive exhibition of the methods and results of modern municipal work has been conceived and carried out in St. Louis by Lucius H. Cannon, Librarian of the Municipal Library. This has been done with the active aid and advice of Mayor Henry W. Kiel, who requested, through President Edmund R. Kinsey of the Board of Public Service, that all city departments should participate. The

exhibit was organized chiefly under the city departments of public welfare, public utilities, streets and sewers, public safety, and the President of the Board of Public Service, the last named having in charge the city's construction work.

On entering the delivery hall, the visitor saw directly in front of him a large model of the northeast corner of Forest Park, showing the recommendations of the Division of Bridges and Buildings of the Department of the President for lowering the grade of the two railroads that pass through this portion of the park, and incidentally abolishing important grade crossings on Lindell and Union Boulevards. This model, which was made originally as an exhibit for a public hearing before the State Public Service Commission, attracted much attention. This department also showed photographs illustrating the construction of streets, sewers, bridges and buildings. An important feature was interesting material concerning the municipal bridge, one of the most noteworthy constructions of the kind in the United States.

Under the Department of Public Welfare were the exhibits of the Health Division, the

City Hospital, the Division of Parks and Recreation, the City Sanitarium, and the Municipal Nurses. Photographs properly labelled and displayed on screens were freely used.

The work of the City Hospital in occupational therapy was interestingly shown and included several glass cases filled with objects made by patients. In connection with the work of the Municipal Nurses there was a display of infants' garments.

The exhibit of the Department of Public Utilities comprised those of the Water Division and the Lighting Division. The former was very comprehensive and included an entire model filter plant on a scale of 1/150, with wash water tank and water meters arranged to show clearly the operation of the machinery. The actual chemicals used in the purification of the Mississippi River water were shown in bottles, and the various stages of purification were exhibited in large glass jars. The Division also showed an interesting set of wall maps and the machine for tapping water-mains while still under pressure, obviating the necessity of shutting off the water. The Lighting Division showed both full-size and reduced



WATER DIVISION SECTION OF THE ST. LOUIS PUBLIC LIBRARY'S MUNICIPAL EXHIBIT

models of the new electric light standards recently installed by the city in the public parks and on the boulevards.

The Department of Public Safety exhibited photographs and schedules illustrating the work of its various divisions, including that of fire and fire prevention, which attracted perhaps more attention than any other item in the exhibit. It showed a full-size fire-alarm box and the exact mechanism used in receiving and recording fire signals at the engine houses. Demonstrators on duty during a large part of the day showed the workings of this and other machinery in the various exhibits to interested visitors. The work of the City Plan Commission, both already carried out and planned for the future, was shown by photographs on screens.

The delivery hall was decorated during the exhibit with potted plants furnished

from the greenhouses of the Division of Parks and Recreation and constituted a striking addition to the exhibit of this department.

The exhibition has already shown practical results. Although planned at first for the month of October only, it was extended to the close of the year—a period just three times as long as that contemplated, as it was evident that public interest required the extension.

Interest in this exhibition has not been confined to St. Louis. Several requests for information regarding methods of organization and display have been received from other cities, and the prospects are that other municipal exhibits of this type will be given in the future and will render greatly needed service in the cause of popular education.

WILLIAM E. ROLFE,

Associate to the President, Board of Public Service.

Our Community Chest

1. Has substituted cooperation for competition in doing the social work which must be done each year in this city.
2. Has afforded a common platform upon which everyone may stand, regardless of race, color, creed or nationality.
3. Has demonstrated itself to be the logical "next step" in the organization of our resources, both in men and money, for social service.
4. Has vastly increased the number of those interested in social work in and for Cincinnati.
5. Has increased the interest of the individual giver in the work to the doing of which he has contributed his money.
6. Has made evident to everyone the fact that social work is an obligation of citizenship.
7. Has convinced the giving public that constructive work is possible.
8. Has shown that the insuring of human welfare is one big problem rather than a series of unrelated small ones to be solved as separate things by uncoordinated and uncoordinated action.
9. Has saved the giver the annoyance of continual solicitation by an endless number of individual collectors representing different agencies and organizations.
10. Has lessened the cost of collecting the funds which are absolutely necessary for carrying on the work being done by the 75 agencies which, coordinated, compose the Community Chest.
11. Has supplied a workable instrument for the examination of the needs of both the city and the different organizations.
12. Has given wise suggestion and helpful assistance to the different agencies.
13. Has coordinated public and private agencies.
14. Has been the greatest single factor in the development of social education in Cincinnati.
15. Has secured the enthusiastic support of practically every great philanthropic and civic organization in this community.
16. Has given to Cincinnati a place of acknowledged leadership among American cities in the wise handling of its social problems.
17. Has made possible an increase in preventive work rather than a mere enlargement of ameliorative effort which must necessarily be repeated year after year.
18. Has resulted in a general bettering of methods of work.
19. Has provided an accessible, reliable and comprehensive record of the handling of specific cases by different agencies, thus making wasteful and harmful duplication of effort unnecessary.
20. Has made possible wise planning for the future.
21. Has given an opportunity for a more economical administration of individual agencies through the establishment of a Central Purchasing Bureau.
22. Has given a background of permanency to social work here which insures its future stability.
24. Has developed a sense of social obligations in the entire community.
25. Has been one of the great unifying forces in the life of the city.

—From the *Bulletin* of the Woman's City Club, Cincinnati, Ohio.

Curing Concrete Roads with Calcium Chloride

Interesting Results of Field Tests in Illinois

FIELD tests which were conducted during the last year by the Illinois State Division of Highways have developed amazing results in the rapid curing of newly laid concrete highways through the use of calcium chloride. The field tests were preceded by extensive laboratory investigations, in which practically every conceivable method was tried out. Between 450 and 500 specimens of concrete were made

and tested. Throughout all the tests, those specimens in which calcium chloride was used showed the best results. The chemical was applied in a number of different ways, but the best results were obtained when the specimens were sprinkled with granulated calcium chloride at the rate of about 3 pounds per square yard of surface. This method of curing gave higher strength in 14 days than the usual wet earth or ponding method does at the end of 28 days.

was used is practically complete within the first 24 hours, after which it does not aid appreciably. The chemical is usually applied to the pavement from 8 to 16 hours after the concrete is finished. Thus it is not difficult to protect it from rainfall if the weather looks threatening or to apply a second lot if the first is washed off.

Tests of this method on roads under construction were made during the last con-



A PORTION OF ROUTE 5, ILLINOIS STATE HIGHWAY, BUILT BY McCALL CONSTRUCTION COMPANY, USING CALCIUM CHLORIDE FOR CURING

struction season. On one job of seven miles of pavement the concrete was cured by covering the paving with about one inch of earth and then sprinkling it with a strong solution of calcium chloride. The solution was applied so that the chemical was equal to about four pounds of dry chemical per square yard of surface. The earth covering held the solution on the road and prevented the complete loss of the chemical in case of rain. The solution to be used for curing was placed in water barrels along the road the day before the sections were completed, and when applied was sprinkled from an ordinary watering-can. Frequent inspection showed that the earth remained moist, proving conclusively that the pavement was cured satisfactorily.

The investigators felt that the strength of the calcium chloride might be nullified by heavy rains, which would wash this readily soluble chemical from the pavement and thus reduce its curing properties. Tests were made in which the granular chemical was washed off the specimen at the end of 12 hours. It was effectively shown that the curing process in which calcium chloride

was used is practically complete within the first 24 hours, after which it does not aid appreciably. The chemical is usually applied to the pavement from 8 to 16 hours after the concrete is finished. Thus it is not difficult to protect it from rainfall if the weather looks threatening or to apply a second lot if the first is washed off.

Tests of this method on roads under construction were made during the last con-

advantages over the use of wet earth, or ponding, which has been used for a number of years. This method is economical, as it costs less than 6 cents per square yard of surface cured. There is considerable saving in labor, because no pipe line is needed. Another distinct advantage is the fact that the calcium chloride can be applied sooner after the completion of the road than the wet earth or the ponding method, thus making it possible to open

roads to traffic at an earlier date without danger to the concrete.

Solutions of calcium chloride have also been used in the water in the mixers during cold weather, making it possible to work the concrete readily and prevent freezing. This method, while it does not protect the concrete from exceedingly cold weather, will materially lengthen the construction season in the fall, reacting to the benefit of highway department and contractors.

Safety During Road Construction

Methods of Handling Traffic and Arranging Detours

By A. R. Hirst

State Highway Engineer, Madison, Wis.

MANY accidents are caused by failure to take proper precautions during the construction of roadways. If the road is to be kept open to travel during construction, the safety and convenience of the traveling public should be the paramount consideration. In too many instances it is almost totally disregarded.

Roads under construction should be either wholly closed to general traffic or kept open under conditions which guarantee safe and easy passage. If they are kept open, the grading should be kept closely in hand. In ordinary road work there is no great rea-

son why there should be more than one mile between the completed grading and the first plowing ahead. In most cases, contractors would be much ahead if, instead of spreading their work over the whole length of the contract and finishing nothing until the last operation, they would keep the grading operation well in hand and finish as they go. They can start a slope-trimming and finishing crew as soon as the roughing cut has proceeded not more than a mile.

On many highway jobs the grade lifts are too heavy. Drops of three or four feet at the end of a fill are not uncommon. This is contrary to most specifications, makes a poor road, poorly compacted, and also greatly inconveniences the travel in going both up and down the breast. Even where the cut or fill is not completed, the road can be kept reasonably smooth by operating a grader constantly over it as the material is being cut and filled.

The most striking difficulties encountered in keeping the roads open during construction are caused by making short detours around culverts and bridges wherever the alignment permits. It is much better to build the



MAINTENANCE ON THIS IMPORTANT INTERSTATE HIGHWAY DETOUR WOULD SAVE TOURISTS TIME, MONEY AND TEMPER



IN CONNECTICUT, ROADS ARE BUILT HALF AT A TIME, AND TRAFFIC IS THEN SAVED A LONGER TRIP OVER AN ALTERNATE ROUTE

bridge on a new site, even at the cost of a few hundred dollars additional, and permit the traffic to use the old bridge rather than a temporary structure. In quite a number of cases curves occur near bridges and it is possible by a new alignment at that point to build a new bridge and maintain the old one during construction.

In the case of culverts, instead of detouring the traffic across ditches and through fields, which usually are impassable after each rain, the engineer should build the culverts in two sections. While it is slightly more expensive to do this, the additional cost is made up many times in savings to the traffic. Experiments have been made in Wisconsin with this method during the last season. Plans and specifications for 1922 call for the construction of culverts in two sections wherever the road is to be kept open for traffic.

In some of the Eastern States roads have been built in halves and the traffic dispatched in a single direction by a system of telephoning. In traveling over sections of highways so handled this year, I was impressed that for main line traffic this method was unsatisfactory. Unless there were positively no detours available, the

money expended in dispatching and in the additional construction under such conditions could have been spent in fitting temporary detours for traffic, with more satisfactory results. On Sundays and legal holidays the traffic conditions on such sections must, indeed, have been serious.

Attention to Detours

If highways under construction are to be absolutely closed, careful attention should be given to the detour. If possible, the road over which the detour is to

be carried should be given the proper amount of attention the preceding year. Nothing is more exasperating to the motorist than to be detoured along a certain highway and to find it has been recently graded to be ready for the detour and is itself as impassable as the highway from which traffic has been diverted. A little more care and attention given in advance to detours will pay heavy dividends in satisfaction to the traveling public.

If opportunity exists, it is much better to provide a detour for one line of traffic and to use another highway for traffic going in the opposite direction; if the roads selected for detours are narrow, this method avoids



WHEN THE HALF-AT-A-TIME METHOD PERMITS ONLY ONE LINE OF TRAFFIC, THIS IS REGULATED BY A TELEPHONE, IN MASSACHUSETTS

many accidents and complications in meeting and facilitates the passage of both lines of traffic. Furthermore, the detour roads are not quite so seriously damaged if the traffic is halved. If there is any question or reasonable doubt, a double detour should be used.

Needless to say, detours should be marked and well maintained. Proper posting of detours does not mean just pointing an arrow at the first turn away from the road under improvement; it means a consistent series of signs directing traffic adequately from beginning to end of the detour. There is no more helpless feeling than that which comes to one lost on a supposed detour at midnight with the rain descending and all the farmers in the neighborhood gone to bed. If all engineers and contractors had been caught in such a predicament, as the writer has been, much greater care would be used in the selection, maintenance and marking of detours.

A good many present-day highways must be detoured when constructed. It is practically impossible to construct a concrete road without detours. The same is true of

almost any other road except graveling and grading jobs. The cost of detouring is a very heavy charge on the traveling public. Almost invariably detours are longer than the road under construction. If the road under construction carries heavy traffic, the cost of traveling an extra mile on the detour is very heavy. A detour three miles longer than the main road, carrying a traffic of 800 vehicles a day, means a daily total extra travel of 2,400 miles, which even at 10 cents a day is \$240 per day. If the road under construction is kept closed for four months, the cost of detouring will be \$28,800, and unless the structure is of such character as absolutely to preclude taking traffic through, any reasonable expenditure in keeping it open for traffic is fully justified.

Whether to detour or not is a matter of special consideration for each particular set of circumstances. Detours should certainly be kept to the minimum both in number and in length, and if necessarily used should be made as safe as possible and as unmistakable as foresight can make them.

ACKNOWLEDGMENT.—Illustrations by courtesy of the Portland Cement Association, Chicago, Ill.

A Glimpse of South America's Largest City



VIADUCT OF SANTA THERESA, RIO DE JANEIRO, BRAZIL

The Principles of City Planning

By Harland Bartholomew

City Plan Engineer, St. Louis, Mo.

CITY planning is that phase of municipal activity which analyzes the character and probable extent of the city's growth, suggests certain physical readjustments and provides for the co-ordination of all future improvements. Under proper and sympathetic administrative agencies it would make possible the gradual and economical development of an orderly, well-arranged city, which would provide good living conditions for all its citizens, and would be everywhere wholesome and attractive in appearance and free from those physical defects that hamper commercial and industrial activity.

City planning is essentially concerned with the physical development of cities. It has nothing to do with political or administrative policies. The city plan will largely influence, for good or bad, the lives of its people, so long as the city endures. It should transcend all other considerations.

It is a well-recognized fact that modern cities are lacking in unity of design, do not easily promote the expansion of commerce and industry, and have numerous residential districts of doubtful value. The past few years have produced a noteworthy public realization of the deficiencies and mistakes of city growth. Few cities are not now engaged in attempting to correct the evils that are the result of past neglect.

Those things which properly constitute the city plan are six in number:

1. Street system
2. Transit system
3. Transportation (rail and water)
4. Public recreation
5. Zoning
6. Civic art

These are the physical elements which, when properly planned and correlated, make possible the creation of an attractive and orderly working organism out of the heterogeneous mass we now call the city.

In the development of a city plan whereby the growth of a city may be controlled over a period of fifty years or more, we are confronted with the application of these six factors, in

- a. Areas now in whole or in part developed with streets, buildings, and customary improvements, and
- b. Areas as yet undeveloped and unimproved.

It is far more simple to plan for new growth than to replan areas already developed. The cost of planning new areas is small indeed. To replan areas already developed is often costly, and yet even the cost of replanning is usually more than justified in the greater degree of usefulness which results. A new impetus is given to growth, finding its reflection in increased local property values, and greater public convenience.

The Street System

The street system is the fundamental element of the city plan. It is the skeleton or framework of the city structure. There are three types of streets that every well-planned city should have:

1. Main arterial thoroughfares
2. Secondary (cross-town) thoroughfares
3. Minor streets

The main arterial thoroughfares should be of commodious width (100 feet or greater), and provide continuous and direct communication between the central business district and all parts of the city. They may be compared to the spokes of a wheel, radiating in all directions from the hub. In so far as these main arterial thoroughfares are provided, just so far is communication facilitated and the uniform expansion and growth of a city encouraged.

The secondary or cross-town thoroughfares should be preferably 80 to 100 feet wide, providing easy communication between outlying districts of the city. Where the rectangular form of street platting has been followed, as is the case in most cities, these secondary cross-town thoroughfares should be spaced approximately one-half mile apart. When new growth occurs, they should continue to provide the necessary intradistrict communication, either by extending those which exist or are planned in the built-up portions of the city, and in addition assume the form of concentric circles about the built-up city area, spaced approximately one mile apart.

Minor streets are those which are used chiefly for residential purposes. Their design and arrangement should be such as to facilitate access, but not to provide for or encourage anything but "local" traffic. Widths of approximately 50 feet should be satisfactory, supplemented by set-back lines for all buildings. The platting of minor residential streets should not be of the rectangular type alone. Variation in topography often justifies departure from the rectangular method of platting, and where there is no variation in topography, a slight departure from the rectangular method often affords relief from monotony of development, and a greater degree of interest and charm.

A fourth classification of street type might be added, in what is sometimes called the special service street, such as that serving industrial areas. The width, arrangement, and design of special service streets are dependent upon the service which they are expected to perform.

Transit System

The provision of transit facilities involves various types of carriers, including the street car, the motor bus, the rapid transit line, and the more modern facilities now being developed, such as the trackless trolley. The city plan is not concerned primarily with questions of fare, methods of operation, ownership, or volume of service, except as these questions affect the unified character of the system and its direct relation to the distribution of population and the physical arrangement of the city.

It is a generally accepted fact that the operation of a system, whether privately or publicly owned, is largely dependent upon the street plan. An adequate system of main arterial thoroughfares and secondary cross-town thoroughfares will make possible the plan of a satisfactory system of transit facilities.

A unification of the transit facilities to be provided upon the streets of the city is to be desired and will be productive of best results. With the exception of the largest cities, the great volume of traffic is cared for by a system of street car lines. After an adequate major street plan has been devised, attention should be given to the rerouting of existing street car lines in (a) the business district, and (b) the remain-

ing areas of the city, in order that more direct and expeditious service can be provided. Combinations, rearrangements and extensions of facilities, regardless of their type, can then be planned to meet the needs of a growing city. There will thus be established a definite plan of procedure in place of the more or less common makeshift policies of temporary readjustments.

Transportation—Rail and Water

Steam railroad and water-borne traffic are to be considered under the term transportation. The problems of each city in this phase of planning vary greatly in accordance with the size of the city and the number of railroads and water routes established. There are four classes of traffic to be considered:

1. Passenger traffic
2. Through car-load business
3. Local car-load business
4. Local l. c. l. (less than car-load) business

Only after a thorough study of the existing conditions in a city, its needs and probable increased growth, can suggestions for adequate planning be made so that new facilities may fit into the general city plan.

There is a marked tendency toward unification of transportation facilities within cities. In so far as unification of service can be provided, this should be done. There are practical limitations upon the early accomplishment of unification of service, such as the expense of wholesale readjustments and undue interference with present highly developed facilities, that necessitate only the most gradual development of unification of facilities.

Unification of passenger traffic facilities has been more customary than for other types of rail and water traffic. Union passenger stations are to be found in many cities and are desirable where practicable. Where more than one station for passenger traffic is found to be necessary, they should be located carefully with respect to the street arrangement, the business district, and the center of population.

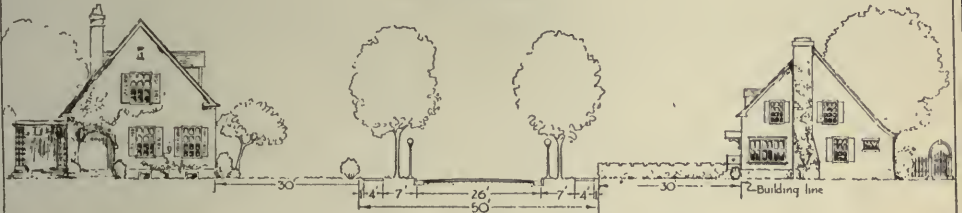
Where the freight facilities of a city become congested or a hindrance to the movement of street traffic or to the enlargement of commercial and industrial areas, it will usually prove desirable to locate freight yards outside the developed areas of cities and provide belt lines whereby through freight may be routed around the city with-

PROPOSED CROSS SECTIONS OF MAJOR AND MINOR STREETS MEMPHIS TENNESSEE

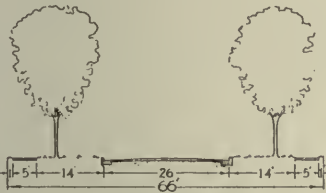
HARLAND BARTHOLOMEW

CITY PLAN ENGINEER.

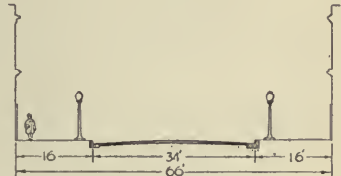
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TYPICAL CROSS SECTION FOR MINOR STREETS

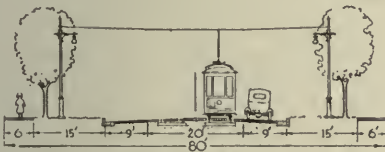


INITIAL DEVELOPMENT

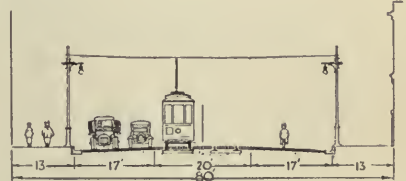


FINAL DEVELOPMENT

SIXTY-SIX FOOT STREET



INITIAL DEVELOPMENT



FINAL DEVELOPMENT

EIGHTY FOOT STREET



INITIAL DEVELOPMENT



FINAL DEVELOPMENT

ONE HUNDRED FOOT STREET

STREETS IN EVOLUTION

How wise planning may reserve for later public use space not yet actually required for roadway

JHB

out entering it and congesting local terminals.

The location, capacity and arrangement of classification yards should be such as to facilitate early delivery from road movement of local car-load freight to industries and to team tracks. Team track facilities should be properly located and of sufficient size to be somewhat in advance of the needs of the community. Similarly, the facilities essential to the early collection of local out-bound car-load freight should be such as to insure early delivery for road haul. This implies reduction to a minimum of rehandling and consequent loss of time and unwarranted cost. As cities increase in size, the volume of local l. c. l. traffic usually increases correspondingly, while the complications of handling l. c. l. freight increase in greater ratio. There is need, therefore, of studying not merely the facilities at hand, but the methods of handling. The relation between the city plan and freight movements is best illustrated by the fact that an improper method of handling may produce an unwarranted number of vehicles upon the streets, while improper locations of freight houses may necessitate hauling of freight through congested retail centers, with which the freight traffic has nothing in common.

Public Recreation

It is only within the past fifty years that the courts have come generally to recognize the necessity for the expenditure of public funds for recreation facilities. So long as we allow people to congest and overcrowd sections of the city, it becomes necessary to provide forms of recreation which people demand but are unable to provide within and about their homes. The several types of public recreation facilities which cities should provide in varying degree according to their size and density of population are:

- a. Community centers
- b. Children's playgrounds
- c. Neighborhood parks
- d. Recreation fields
- e. Large parks
- f. Boulevards and outlying parks or reservations

It is not to be supposed that a city could provide all the recreation facilities that might be created or desired. It is particularly important, therefore, that the city's

expenditures for public recreation facilities of various types should be so distributed that the maximum amount of service will be provided for the greatest number of people.

The community center is a well-recognized public recreation agency which also offers splendid opportunities for educational work, Americanization, a forum for the discussion of public affairs, and the like. Properly designed school buildings are the best community centers, particularly since community center activities are greatest in out-of-school hours. Hence the provision of community service is largely a matter of organization and administration rather than of city planning, for it is presumed that school buildings will have been located in accordance with the distribution of school children and hence quite properly fit into the general city planning program.

The first important consideration in devising a system of children's playgrounds is that of selecting sites within congested districts and within easy reach of large numbers of small children. A study of distribution of school children, density of population, and juvenile delinquency throughout the city will readily suggest the location of children's playgrounds.

Neighborhood parks are needed in all residential districts and should be more numerous where population is dense. A study of present and prospective population density and of available park areas will readily suggest where neighborhood parks should be provided.

Large parks and recreation fields are one of the most highly prized assets of cities. Many cities possess such areas, although their acquisition has more often been the result of chance gifts or opportune purchase rather than of conscious effort to provide facilities within easy access for all citizens. All cities should have large parks so located that persons in all parts of the city may find one or more of them easily accessible. Often land unsuited for residential or industrial development and reasonable in price will make splendid park area, enhance the character and value of surrounding property and provide the play facilities so essential to city life.

Once a careful plan for the development of various public recreational grounds has been determined, its gradual execution

should be a matter of fixed policy. In addition to the areas provided within, or adjacent to, the built-up city area, there should be an effort to secure areas in outlying territory while they are still cheap, unspoiled, and in advance of the city's growth. A system of boulevards connecting large parks within developed city areas and extending to the larger outlying parks or reservations, and perhaps having connection with the central business district, will not merely insure the development of a unified recreation system, but will be reflected in a better character of residential development, increased and stabilized land values, and hence increased taxable returns.

Zoning

After the four important elements of the city plan, namely, streets, transit, transportation and public recreation, have been determined and the physical structure of the city thus planned, it becomes a matter of evident reasonableness to regulate property use in all parts of the city in accordance with these several elements. The major streets may, for parts of their lengths at least, quite naturally be expected to become commercial streets. Areas provided with railroad facilities should be encouraged to develop for industrial purposes. Areas now occupied, or expected to be occupied, for residential purposes, having streets planned in accordance with residential needs and supplied with recreation facilities, should most certainly be given the protection essential to their permanency of development through exclusion of industrial or commercial intrusions.

A zoning ordinance will give stability and character, as well as encouragement, to the proper development of the city. A zoning ordinance provides three kinds of regulations, which affect (1) the uses of property

and buildings; (2) the heights of buildings; and (3) the size and arrangement of buildings upon lots and open spaces about such buildings. A zoning ordinance will encourage like types of structures within districts to be determined in accordance with their most natural fitness. Zoning ordinances recognize prevailing types of development and are not retroactive in their provisions. Existing buildings and uses of property are permitted to continue, but new buildings must be built in locations set aside for them, sufficiently large and otherwise suited for full and free expansion.

Civic Art

Unfortunately, city planning work has often been erroneously considered as the municipal activity concerned merely with the superficial beautification or enhancement of the city's appearance. From the foregoing explanation of the basic principles of a city plan, it is believed that the economic and social considerations involved are seen to be essentially fundamental. Once the several elements of the city plan heretofore described have been carefully planned and gradually executed, there will result greater uniformity of development and a more balanced type of growth, which, in itself, will constitute one of the fundamentals of good design—the adaptation of form to function. To be sure, there are certain considerations that should receive special attention, such as the grouping of public buildings at strategic locations, the regulation of poles and wires, certain regulations of signs and billboards, a careful system of street tree planting, and numerous other similar activities that will add greatly to the city's appearance when properly done.

ACKNOWLEDGMENT.—From the First Annual Report, City Planning Commission, Memphis, Tenn.

Reduced Rates for San Francisco Convention of Fire Chiefs

The various railroads over which fire chiefs will travel from the East and Middle West to attend the International Convention of Fire Chiefs to be held in San Francisco next August have given new rates for convention and tourist travel, effective from May 15 to August 31, 1922. This should materially increase the number of fire chiefs from the East and Middle West who will attend this convention.

Municipal Finance

BONDING

ACCOUNTING

TAXATION

Wisconsin's Progress in Uniform Municipal Accounting

THE importance of improved methods of accounting for municipalities was recognized in Wisconsin in 1909, when the Legislature by joint resolution directed the Tax Commission to investigate municipal finances. It was evident from this investigation that municipal accounts were kept in such a manner as to preclude the possibility of comparing results. In consequence, the Tax Commission recommended, and the Legislature enacted, Chapter 523, Laws of 1911. This statute enumerated specifically the duties of the Commission in regard to the collection of statistics and the formulation of a uniform system of municipal accounts. It is in accordance with this statute that the municipal accounting department of the Tax Commission was established and is now operating. This section provides that the Tax Commission shall:

- (1) Inquire into the system of accounting of public funds in use in towns, villages, cities and counties.
- (2) Devise, prescribe, and at the request of any town, village, city or county install, a system of accounts which shall be as nearly uniform as practicable.
- (3) Audit the books of the town, village, city or county officers upon the request of the town or village board, city council, or county board, or upon its own motion.

Under authority conferred by the statute quoted above, a uniform system of accounts has been designed and accountants have been employed to make installations and audits. The system prescribed is complete enough to fulfill all accounting needs of the municipality and at the same time is comparatively simple to understand and to operate. The accounts are especially designed to meet the requirements of the financial reports required by law and con-

form to the classification approved by recognized authorities on municipal accounting. Up to the present time sixty-one cities and forty-seven counties have voluntarily adopted the system.

In addition to the installation service, one hundred and fifty audits have been made upon request of Wisconsin municipalities. In many cities and counties audits have been made annually for several years. For the most part, the requests have come from city councils or county boards as the case may be, but in some instances where officials have refused to authorize examinations for the reason that their own conduct would be subject to review, audits have been undertaken upon the petition of interested taxpayers.

In addition to disclosing irregularities resulting from ignorance of the law, the audits completed by this department have brought to light actual cash shortages in excess of \$100,000 resulting from wilful intent upon the part of officials to misappropriate public funds. The discovery of the shortage usually resulted in the conviction of the official and the recovery of the amount misappropriated. In many instances where discrepancies were found, the general laxity of the governing bodies was in part responsible for the default by making it possible for dishonest officials to cover up manipulations extending over a period of years. In some cases officers were not held to a proper accounting during their entire tenure of office, and in others the systems of accounting in use were such as to encourage them to acts of misconduct. In both of these matters it is entirely within the province of the town or village board, city council, or county board to correct the situation by authorizing an audit by this department or by requesting the installation of the state

uniform system of municipal accounts.

We believe that state supervision of municipal finances has worked to the distinct advantage of Wisconsin municipalities. In the first place, competent auditing and accounting service is made available at actual cost. The accountants engaged exclusively in this work have become specialists and are thoroughly conversant with municipal procedure. Few, if any, private or commercial accountants in the state have handled sufficient municipal work to become as thoroughly qualified in this work as have representatives of the municipal accounting department. In the second place, it is now well established that the many problems peculiar to municipal accounting preclude the possibility of success except under authorized central direction. Without supervision there would be no adequate degree of uniformity. Then, too, municipal officials are constantly changing and some agency must be available from which the new officials can receive assistance relative to accounting matters. An effective follow-up policy, so essential in municipal installations, is a feature of the work and is pos-



CHART SHOWING WISCONSIN COMMUNITIES AND COUNTIES OPERATING UNDER THE UNIFORM SYSTEM OF MUNICIPAL ACCOUNTING

sible only through the direction of a state agency.

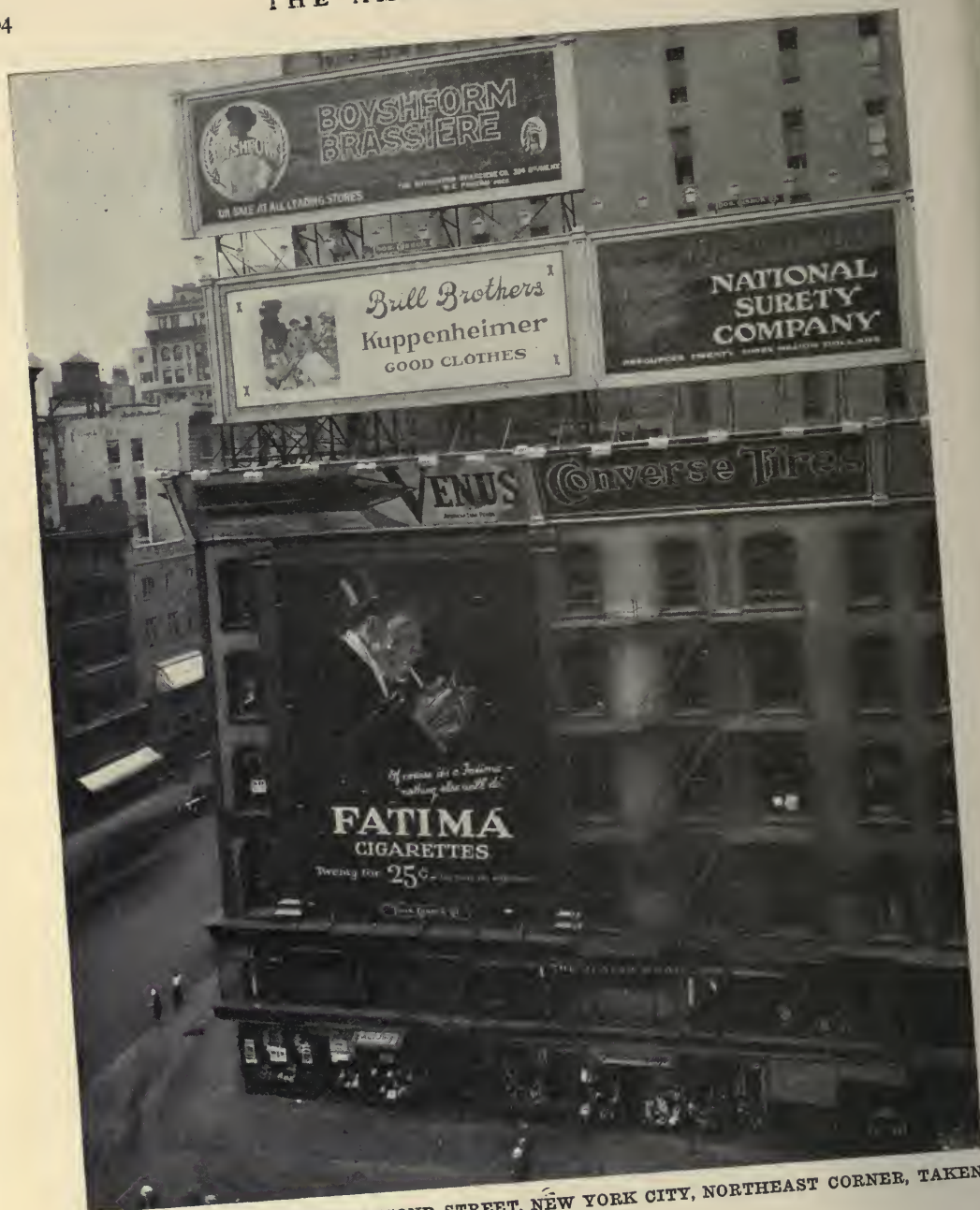
ACKNOWLEDGMENT.—From a reprint of Bulletin No. 10, October, 1921, issued by the Municipal Statistics Department of the Wisconsin Tax Commission.

The Bill-Board Blight

BILL-BOARDS have been treated in many ways in various pamphlets, but there is a personal side to the relation of the bill-board to the community which has not yet received due attention. Accordingly, the Municipal Art Society of New York has thought it worth while to issue another bulletin dealing with outdoor advertising and taking up the subject from the citizens' point of view. The purpose, as the Society frankly states, is to suggest to every citizen that neither political experience nor legal knowledge is required for a protest to public officials who are responsible for preventing any invasion of the general rights of the public and for protecting civic improvements.

The outdoor advertiser affects us all when he inconsiderately plants a bill-board in such a way as to detract from the beauty of a public park, a fine public building, or a noted thoroughfare. The Municipal Art Society and those cooperating with it take pains to state in their bulletin that they are

in no way hostile to legitimate advertising, which is universally acknowledged to be one of the great sources of progress in civilization. But they maintain that those advertisers who use public places as their background have failed to grasp the rights of the public in such places, and have failed to sense the growing irritation and hostility of a very large part of the public towards the unnecessary entrance of bill-board advertising where it does not belong. They hold that outdoor advertising should be limited to those buildings in which the business advertised is actually carried on, and that when a building standing on a corner of a famous or beautiful street is plastered with advertisements, there are two parties who have been injured: first, the tenants of such buildings, who suffer from the loss of dignity which the building inevitably incurs; and, second, the public, who do not wish to be compelled to gaze at such attention-compelling signs. When bill-board advertisers hire space on a famous street like



FIFTH AVENUE AND FORTY-SECOND STREET, NEW YORK CITY, NORTHEAST CORNER, TAKEN IN SUMMER OF 1921

Fifth Avenue, New York, opposite a great public building like the New York Public Library, or when they rent space opposite the public parks and public buildings in hundreds of our smaller cities, they show a contempt for the very civic beauty which their fellow citizens have constructed at so much labor and expense. Their conduct

most certainly proves them not only lacking in civic pride and civic obligation but emphasizes the fact that they do not deserve the patronage of any citizen who desires to make his home and the community as a whole a more attractive place in which to live. The Municipal Art Society puts bluntly as follows:

"What is the use of erecting, at the public's expense, public buildings of great beauty, if their effects can be lessened by the act of an individual who seems to consider a great city as merely a background for his private interests? What is the use of producing a picture of natural loveliness, such as a beautiful park, and then allowing its borders to be defaced by the kind of advertiser who regards the charm and beauty of a public park as merely a setting for his own selfish business interests? Why should merchants be allowed to spread their advertisements of food and drink and tobacco and tires and clothing over the walls of dwellings where their intrusive statements stare people in the face in their very homes?"

Public officials are unanimous in their testimony as to the insanitary condition which frequently surrounds bill-boards. Street cleaning commissioners state that bill-boards attached to railings cause rubbish to accumulate in front of buildings, that vacant lots surrounded by fences bearing bill-board advertising are gathering-places for paper and rubbish, and that the work of street cleaning departments is greatly increased because of the trash that collects around bill-boards. Police officials likewise report that bill-board structures in many cases offer a screen for lawless and criminal practices.

The bill-board as a highway hazard is discussed in the report of the Motor Vehicle Commissioner for Connecticut for 1921, which states that 348 accidents occurred during the year in Connecticut at places where there were huge advertising signs giving the history of adjacent towns. Motorists driving along had their attention distracted by the sign, and while their eyes were off the roadway other cars came up and collisions occurred.

The bill-board blight is not a question of sentiment alone. It involves the health and safety of the citizens as well as their esthetic views. The latter have their proper place. They are not by any means the only phase of the problem. Promoting public health by city-wide cleanliness, preventing crime and highway accidents, and preserving the value of public parks and buildings are duties which devolve upon city and county officials. In so far as unwisely placed or carelessly maintained bill-boards interfere with the full discharge of these duties, they constitute a real problem to which public officials sooner or later must give serious attention.



DAY IN AND DAY OUT THE DWELLERS IN THIS NEIGHBORHOOD ARE FACED WITH THE WEARY MONOTONY OF THESE SIGNS

A Southern Deep-Well Water-Supply

With Seven Wells in Use and Eighteen in Reserve, Montgomery, Alabama, Is Amply Protected Against Shortage

By H. A. Washington
City Engineer

THE deep-well water-supply of Montgomery, Ala., was purchased from the Capitol City Water Works by the city for \$600,000 in 1898. The present total bonded indebtedness of the water department is \$975,000, while the total value of the plant is \$1,966,800.19.

The water-works have been particularly fortunate in being able to operate from 1898 to date with the same rates that were charged in 1898. The highest domestic rate per 1,000 gallons is 15 cents, with 10 cents the commercial rate per 1,000 gallons and a minimum annual charge of \$12. There are 9,593 services, of which 8,191 are metered, making the city 85.38 per cent metered. The average daily consumption is 4,500,000 gallons, or about 104 gallons per capita, the population being 43,464.

QUANTITATIVE ANALYSIS OF SAMPLE FROM GENERAL SUPPLY

Sodium chloride	1.3398
Sodium carbonate	8.7905
Potassium sulphate	0.2053
Potassium carbonate	1.4807
Calcium carbonate	0.5898
Magnesium carbonate	0.2679
Iron and aluminum oxides.....	0.2436
Volatile and organic matter.....	0.7640
Total solids	0.9280

14.6096

The water, an analysis of which is given below, is neither filtered nor sterilized, as it has been found of uniform quality at all times and no softening has been considered necessary:

The seven deep wells which are used throughout the year are in water-bearing sand strata varying in depth from 200 to 600 feet. Water is pumped from the seven wells by Layne & Bowler deep-well rotary pumps direct-connected with vertical motors. The seven units, which have a total daily output of 6,320,000 gallons, discharge into five underground storage reservoirs with a combined capacity of 3,373,000 gallons.

Water is pumped into the mains by two high-pressure Allis-Chalmers centrifugal pumps. Two stand-pipes, having a combined capacity of 1,075,000 gallons, are used to equalize the pressure in the mains. There are 131.94 miles of cast iron main, varying from 4 inches to 26 inches in diameter. For purposes of control there are 1,036 gate-valves, and 685 fire hydrants have been put in.

In addition to the plant already de-



GENERAL VIEW OF THE MONTGOMERY, ALA., WATER-WORKS

The three small white buildings house three of the seven wells and turbine pumps. The large brick building in the background is the old station, housing the emergency steam pump and the air compressors connected with the emergency air-lift plant. Four of the five storage reservoirs also may be seen

scribed, the city holds in reserve for emergency purposes a steam-driven air-lift plant and an electrically-driven air-lift plant, each of which is capable of delivering about 4,000,000 gallons daily from eighteen wells,

which are separate and distinct from the seven in daily use. In addition, the city operates a plant for pumping and filtering river water, which is sold to the railroads at a rate lower than the domestic rate.

Laying Cast Iron Feeder Mains in New Orleans

By Thomas F. Wolfe

Secretary, The Cast Iron Pipe Publicity Bureau

UNUSUAL soil conditions in New Orleans make the installation of underground pipes a much bigger problem than usual. The soil in parts of the city is a very tenacious clay full of roots and stumps of what was formerly a swamp. While the roots and stumps constitute a serious problem in excavation work, the greatest difficulty lies in the fact that the excavated material cannot be tossed from a shovel. When the excavation is made by hand, each shovelful of dirt must be passed from one man to another from the bottom of the trench to the spoil bank. Not only must this be done, but, between shovelful, each shovel must be dipped in a bucket of water in order to make any progress at all.

When work was started on laying the 43.31-inch (1.1 meter) cast iron pipe, the excavation was done by hand, but it soon became evident that the use of machinery

was advisable, so a clam-shell bucket operated by an Industrial Works crane was put into service with excellent results. Even when a bucket of this kind was used, the tenacity of the clay gave some trouble, until the expedient of keeping a stream of water playing constantly on the bucket was adopted.

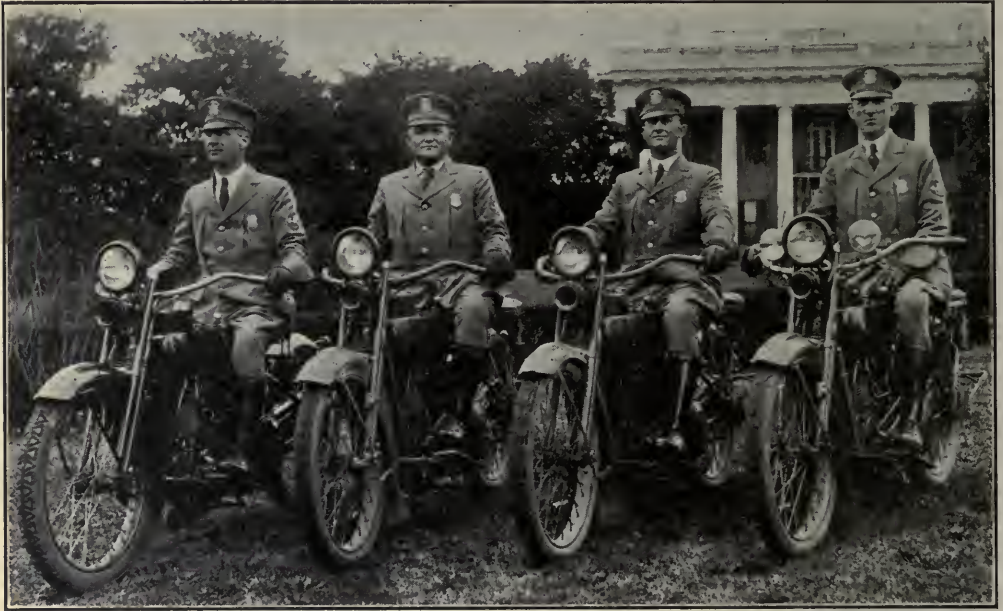
The plasticity of the soil made it necessary to use tight sheeting, even though the ditch of the trench was only about 10 feet. Lackawanna steel sheet piling in 16- and 24-foot lengths was used for sheeting, the longer piles serving as a support for the 12- by 12-inch timbers which carried the track for the crane. The accompanying illustration shows the manner of sheeting the ditch and supporting the crane. The sheeting is driven by a pile driver equipped with a steam hammer and pulled by a second driver which follows the pipe-laying gang. The crane, following close upon the forward driver, excavates the ditch and immediately lays the pipe before moving forward. The ditch is then back-filled and the crane moved forward to excavate for the next length. The stumps and roots are seen in the illustration.

The soil conditions also make repairs to the mains a very expensive operation, but, fortunately, the work which is done by the Sewerage and Water Board is very carefully supervised, so that little trouble develops. The entire water distribution system of New Orleans consists of Class "B" cast iron pipe, ranging in size from 4-inch to 48-inch.



TYPICAL PIPE-LAYING CONDITIONS IN NEW ORLEANS

Motors for Police and Fire Departments



THE MOTOR-CYCLE POLICE OF MACON, GA., MOUNTED ON THEIR HARLEY-DAVIDSON MACHINES



THIS PIERCE-ARROW POLICE PATROL HAS BEEN DRIVEN OVER 160,000 MILES IN THE SERVICE OF THE MILWAUKEE POLICE DEPARTMENT



ONE OF THE MOTOR PUMPERS THAT HELPED CHECK CHICAGO'S GREAT FIRE
ON MARCH 15, 1922

This Mack Pumper is equipped with Morand cushion wheels



A WHITE COMBINATION HOSE AND CHEMICAL FIRE TRUCK IN SERVICE IN DENVER, COLO.

The Logical Application of a City Plan in Kokomo, Indiana

By Charles L. Sellers
City Civil Engineer, Kokomo, Ind.

THE city of Kokomo has just witnessed the completion of a big development project that has been carried out in logical city planning order. In 1920 Gerhart Brothers, a local realty development syndicate, purchased a tract of some 46 acres at the western edge of the city, in the direct path of projection of several of the best residential streets, and developed it in a manner that should serve as a model in such enterprises. It has been named "Forest Park."

The plan was to create a highly restricted, exclusive residential section, appealing to people of means and refinement. It was decreed that no reasonable expense was to be spared, and the entire project was carefully thought out in advance. First, Louis S. Cole, of Chicago, a landscape architect and city planner, was secured to take general charge of the development. After a topographical survey, a design was submitted that not only took advantage of the natural contour of the allotment, but preserved almost every tree in a beautiful grove of maples, elms and beeches which dotted about one-fourth of the tract. Then the plat—of utmost importance, this—was

carefully fitted to the older part of the city in regard to arterial streets.

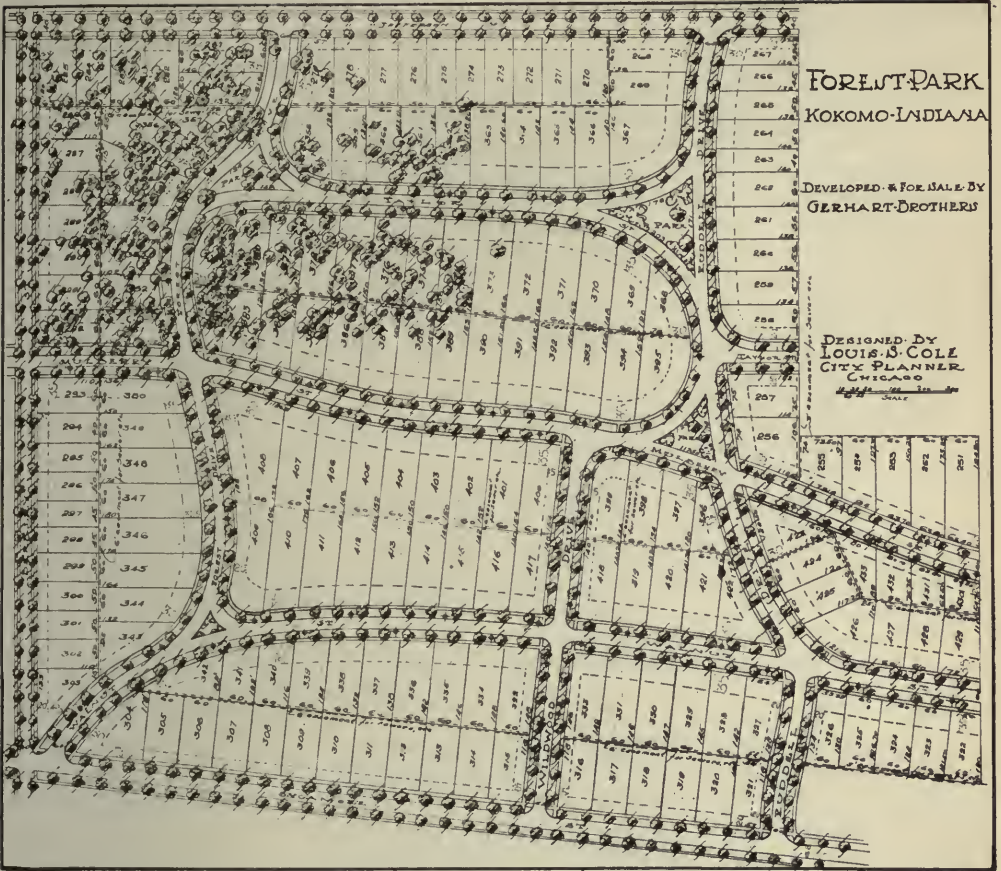
Installing the Utilities

The plat was submitted to the city and accepted through its engineering department and Board of Public Works. Then the actual development began. The first thing undertaken was the construction of an adequate, carefully planned sewer system of reinforced concrete, large enough and deep enough to meet all possible future needs. The main sewer at a point three-quarters of a mile from the outlet is 6 feet in diameter, leaving the subdivision at the opposite side with a 54-inch tile. The system was so planned that it crossed streets and came under pavements in a few instances only. It was completed in the spring of 1921.

At this juncture the Kokomo Water Works Company installed a complete water system, using 8-inch, 6-inch and 2-inch mains in sequence, and cross-tying the mains in such manner as to provide perfect circulation throughout. Service laterals were installed to each lot in the subdivision, and lead pipes were used in all cases where streets were crossed or where the laterals



A STREET INTERSECTION AT FOREST PARK, KOKOMO, IND.
Note the fine trees and the sidewalk built around one of them



LAYOUT OF FOREST PARK, SHOWING USE OF CURVING STREETS AND TRIANGULAR PARKS
 Note the setback lines throughout the development.

would be covered with pavements.

The streets were designed to allow a 13-foot parkway between sidewalk and curb, and it is through this parkway that the water-mains were laid, in order that the pavements need not be disturbed should pipeline repairs become necessary. The parkway plan is this: the water-mains are 3 feet from the curb; English elms 6 inches in diameter were planted at intervals of 50 feet midway between water-main and sidewalk, locating the tree 5 feet from the main, 5 feet from the sidewalk and 8 feet from the curb, as it was the desire to shade the sidewalk rather than the roadway.

With sewer laterals and water-mains established, the gas company then installed all mains in the easements at the rear of the lot lines, service being provided for every lot. There are no alleys. Domestic, light and power service poles also were

placed in these easements, and electric service is brought into the home underground by means of lead cables.

Not until all this was done, not until gas, water and electric services were installed, and the sewer system completed, did the street improvement begin. This improvement included streets, curbs, parkways, decorative parks and street lighting, all in accordance with plans made by the architect in charge. The streets, or drives, consist of a bituminous asphaltic concrete pavement upon a water-bound macadam base. Boulevard traffic only is permitted. While the main drives conform to arterial streets, the general layout is one of sweeping curves, in order not only to enhance the natural beauty of the tract, but to give every home in the subdivision an attractive vista.

Parks occur at frequent intervals and are made possible by the general plan of the

roadways. All the parks are triangular and have been carefully landscaped. Hydrants are provided for all of them, that frequent watering may be done. In the center of the largest park plumbing and drainage have been installed for a fountain. The present plan is to make this fountain a memorial to one of the city's pioneers. It will be shaded by Norway maples, and in each of the three corners of the park stands a Wythe elm, a sentry at the crossways.

The sidewalks are composed of 5-foot slabs of concrete, 4 inches in thickness, laid directly on a rolled clay foundation, with a $\frac{1}{4}$ -inch fall to the street. The sidewalks are underdrained with 4-inch red agricultural tile, which is connected at frequent intervals with another red tile drain under the curb, the whole system draining to catch-basins, making a complete system of rapid drainage for sidewalk and pavement.

The curb is of special design, saucer-shaped, and having a greater water-carrying capacity than the old-style gutter. It does away with the harsh lines of the old-fashioned design, and adds to the safety of motorists. It was found that with curbs of this design narrower roadways could be used to advantage; the curb, which is actually a part of the drive, is sloped so gently that it becomes one with the roadway.

The Street Lighting

Street lighting standards of handsome design have been spaced on both sides of all drives at intervals of 75 feet. These are constructed of reinforced concrete with granitoid surfaces. The reinforcement consists of four twisted iron rods, anchoring to concrete foundations 3 feet deep and 2 feet square. The lighting itself is by charming English lanterns, rich and beautifully quaint, finished in verd de gris antique. The lanterns are 36 inches from the bottom to the top of all ornamentation, and 18 inches in diameter, of special design adopted for Forest Park. Underground cables to the standards are of solid copper in a leaden sheath, the whole protected by spirally wound steel tape. The lighting system is on two circuits, controlled by automatic electrical time switches, providing complete illumination from dusk until midnight, and partial illumination from midnight until dawn.

Considerable interest has been manifested by engineers in the state of Indiana, and in the Middle West generally, concerning the work in Forest Park. It is a plan that will mean not only greater beauty, but actually much greater efficiency at very much lower ultimate cost.

On the Calendar of Conventions

MAY 15-19.—PHILADELPHIA, PA.
American Water Works Association. Annual convention. Secretary, J. M. Driven, 153 West 71st Street, New York, N. Y.

MAY 15-19.—ATLANTIC CITY, N. J.
National Electric Light Association. Annual convention. Executive Manager, M. H. Aylesworth, 29 West 39th Street, New York, N. Y.

MAY 15-21.—WASHINGTON, D. C.
Chamber of Commerce of the United States. Annual meeting. Secretary, D. A. Skinner, Mills Building, Washington, D. C.

MAY 17-18.—WAXAHACHIE, TEX.
League of Texas Municipalities. Annual convention. Secretary, Frank M. Stewart, Bureau of Extension, University of Texas, Austin, Tex.

MAY 22-23.—PLAINVIEW, TEX.
West Texas Chamber of Commerce. Annual convention. Manager, Porter A. Whaley, Stamford, Tex.

JUNE 5-7.—SPRINGFIELD, MASS.
National Conference on City Planning. Annual conference. Secretary, Flavel Shurtleff, 60 State Street, Boston, Mass.

JUNE 5-9.—LOS ANGELES, CALIF.
International Association of Rotary Clubs. Annual meeting. Secretary, Chesley R. Perry, 910 South Michigan Avenue, Chicago, Ill.

JUNE 6-7.—ANTIGO, WIS.
Wisconsin Association of Commercial Secretaries. Annual meeting. Secretary, D. A. Caldwell, Chamber of Commerce, Wausau, Wis.

JUNE 6-8.—POUGHKEEPSIE, N. Y.
Conference of Mayors and Other City Officials of the State of New York. Annual convention. Secre-

tary, William P. Capes, 25 Washington Avenue, Albany, N. Y.

JUNE 9-10.—SWAMPSCOTT, MASS.
New England Association of Commercial Executives. Annual meeting. Secretary, Price Gaines, Chamber of Commerce, Keene, N. H.

JUNE 19-24.—SAN FRANCISCO, CALIF.
International Association of Chiefs of Police. Annual convention. Secretary, George Black, Chief of Police, Wilmington, Del.

JUNE 20-23.—COLORADO SPRINGS, COLO.
National Association of Comptrollers and Accounting Officers. Annual convention. Secretary, Mark M. Foote, Comptroller's Office, Chicago, Ill.

JUNE 21-22.—CROOKSTON, MINN.
League of Minnesota Municipalities. Annual convention. Executive Secretary, Morris B. Lambie, The Municipal Reference Bureau, University of Minnesota, Minneapolis, Minn.

JUNE 21-22.—STROUBSBURG, PA.
Association of Pennsylvania Boroughs. Annual convention. Secretary, J. Herman Knisely, Capitol Building, Harrisburg, Pa.

AUGUST 15-18.—SAN FRANCISCO, CALIF.
International Association of Fire Engineers. Annual meeting. Secretary, James J. Mulcahey, City Hall, Yonkers, N. Y.

SEPTEMBER 12-15.—NEW BEDFORD, MASS.
New England Water Works Association. Annual convention. Secretary, Frank J. Gifford, 715 Tremont Temple, Boston, Mass.

OCTOBER 9-13.—CLEVELAND, OHIO.
American Society for Municipal Improvements. Annual convention. Secretary, Charles Carroll Brown, P. O. Box 234, St. Petersburg, Fla.

Chamber of Commerce Commerce Activities in Public Affairs

Chamber's Engineer Saves City Money in Paving Work

NEW ORLEANS, LA.—The Board of Directors of the New Orleans Association of Commerce early in 1919 appointed a committee to call on the Mayor and urge the paving of the necessary arteries in the section bounded by the river and Camp, Canal and Thalia Streets. The Mayor informed the committee that the city could do nothing at that time because of the depleted condition of the treasury. The committee therefore recommended to the Board that the project be temporarily abandoned.

The Members' Council of the Association of Commerce, however, appointed a committee to go directly to the property owners in the wholesale district and obtain signatures to a petition. The committee then made a thorough study of the city's finances, with the result that a plan was devised whereby the money needed to cover the city's proportion of the paving cost could be furnished. The petition and the plan for financing were presented to the four city commissioners, who agreed to undertake the work.

The project has never been permitted to lag and is now actually completed. At the very beginning, the Association of Commerce formed a committee known as the Business Men's Paving Committee, consisting of interested wholesalers. This committee has held regular meetings to discuss

the progress being made.

A unique feature of these meetings was that they were attended by one of the most competent engineers in the city, who was retained by the Association of Commerce to give the committee expert advice and to see that the paving contractor lived up to his specifications in the quality of material used and the methods employed in doing the work. A spirit of coöperation with the city officials has prevailed throughout the committee's activities, and the weekly meetings are oftentimes attended by the City Engineer and the Commissioner of Public Property, who come to confer on various steps to be taken.



POYDRAS STREET, NEW ORLEANS, IN PROCESS OF REPAIR
These heavy granite blocks were relaid as a base for the new pavement



POYDRAS STREET COMPLETED

City officials and business men generally agree that the Association of Commerce has saved the city and property owners several thousands of dollars by this rather unusual method of lending organized assistance in successfully completing a big paving project.

CHARLES E. WHITE,
Publicity Department, New Orleans Association
of Commerce.

A Chamber of Commerce Fuel Yard

SHARON, PA.—The Chamber of Commerce of Sharon during the winter has developed a practical scheme for furnishing fuel to citizens in distress from unemployment. Early in the fall, the Chamber anticipated the need of being able to furnish fuel to those out of work. Through the cooperation of the railroads five car-loads of old ties were shipped to Sharon and placed in what is known as the Chamber of Commerce Fuel Yard.

Up to January 21, wood had been delivered to 84 families. At that time it was found necessary to send a letter to the membership requesting donations to the Fuel Fund, to furnish coal for needy families. The letter met with a splendid response. The request had been for money to buy 200 tons of coal. In a few days enough money had been received to buy 300 tons. In the month following this request over 200 loads of fuel were delivered to citizens who otherwise would have suffered.

The Chamber was obliged to enter upon this form of relief work to support the existing charitable organizations, whose funds have been insufficient to meet the extraordinary demands of the current winter.

P. A. JONES,
Executive Secretary, Chamber of Commerce.

Rome's Rest Room

ROME, N. Y.—The Rome Chamber of Commerce is proud of the public rest room. It is used by hundreds of men and women, for it stands at the terminus of seven bus lines, some of them giving hourly service to towns eighteen or twenty miles away.

The room is very handsomely furnished. There were definite reasons for spending extra sums in making the place attractive. It scares away the loafer who might be looking for a "hangout." One look tells him that it is no place for him or his kind.



THE UNUSUALLY ATTRACTIVE FURNISHINGS IN ROME'S REST ROOM SCARE AWAY THE LOAFER

The furnishings are also intended to emphasize the rest room idea, and to prevent the place from degenerating into a mere autobus waiting-room.

The room has been supported by voluntary contributions from Rome merchants. The concession for the selling of tobacco, papers, etc., pays for the superintendence. The concession is operated by a man and his wife, the man being on duty morning and evening, and his wife in the afternoon. A free checking service is maintained. Here tourists or shoppers can check packages or luggage. Purchases can also be checked at any store in town, and later called for at the rest room, if so desired.

E. D. BEVITT,
Secretary, Rome Chamber of Commerce.

Knoxville Board Installs Street Signs

KNOXVILLE, TENN.—The street signs purchased by the Knoxville Board of Commerce have just been installed. The accompanying photograph shows W. J. Savage, President of the Board of Commerce, placing a set of the new signs on the Hotel Farragut. At the bottom of the ladder is Postmaster W. P. Chandler, Chairman of the Board of Commerce Street Signs Committee, Mayor E. W. Neal, and J. T. Badgley, Manager of the Board of Commerce.

Street signs for the more than 1,200 Knoxville street intersections were purchased by the Board of Commerce with a special fund raised by the Street Signs Committee. The signs were put up by the city. In the business district they were placed on the buildings, as shown in this picture. In the residential sections the signs were screwed to strong, oak boards

which were nailed securely to telegraph or trolley poles.

The Street Signs Committee of the Board of Commerce was composed of men who, for various reasons, saw the urgent need for new street signs. The first step was to prepare a list of street intersections, so that the committee could know the exact sum it would need to raise. A list of firms and individuals who would profit most by the erection of new signs was then compiled and divided between the several groups of the committee. Funds were solicited not merely on a civic basis, but also as a business proposition. The committee called the attention of firms with large delivery services to the fact that they were losing time and money every day because many of the streets could not be found by their delivery boys. This appeal was very effective, and the necessary fund was quickly raised, in amounts ranging from \$5 to \$100.

Knoxville's growth has been rather rapid, with the result that several communities which ten years ago were separate suburban sections are now a part of our solid city. Each community has its own street names, which made a duplication of names in Greater Knoxville.

The Street Signs Committee is using the ordering of new street signs as an occasion for renaming streets whose names are confusing. Signs for those streets will not be ordered until the City Commissioners officially determine the correct names. The Board of Commerce committee feels that this elimination of conflicting street names is as important as was the erection of the



THE PRESIDENT, THE MANAGER, AND THE CHAIRMAN OF THE STREET SIGNS COMMITTEE OF THE KNOXVILLE BOARD OF COMMERCE, AND THE MAYOR, LOOK LIKE A PRETTY EFFICIENT SIGN-POSTING CREW

new signs, indispensable as they were.

The committee also wrote to the occupants of every home or business house in Knoxville which was not numbered or was incorrectly numbered, urging that correct numbers be put on their houses. This did not bring a unanimous response, of course, but did result in the correction of a large majority of the mistakes.

CARLOS C. CAMPBELL,
Assistant Manager, Knoxville Board of Commerce.

Quick Work in Santa Rosa

SANTA ROSA, CALIF.—When Santa Rosa awoke, on the morning of November 16, to find her 485 high school pupils "homeless," the high school building having been completely destroyed by fire, the Directors of the Chamber of Commerce immediately called a meeting with the Board of Education, and without parley made a survey of the most strategic location for rebuilding the school. Long before the embers of the old school had ceased to smoulder, the Chamber of Commerce had an option on sixty-five acres of property at the north city limits, which it later purchased and is holding in trust for the new high school district. This district has been created by combining the city with twenty-five adjacent common school districts, and embodies about one-third of the county's population. Private interests were sacrificed, real estate commissions were waived, and leases cancelled, and there was one of the finest manifestations of community spirit that have ever been recorded in northern California. The result will be a half-million-dollar school project within a few years, making Sonoma County a leader in educational advantages.

The new school property adjoins the Luther Burbank Creation Garden, which comprises thirty acres and was purchased jointly by the city of Santa Rosa and the Chamber of Commerce. Last September it was officially dedicated to the memory of the world-known scientist, Luther Burbank. It is planned to have Mr. Burbank participate in planting there specimens of his horticultural and agricultural creations and improvements, and at some future date to build in the gardens a large community auditorium. Both the Garden and the new school site are located on the Redwood Highway.

Santa Rosa's plan of work for the coming year involves a movement for the city manager form of government; a campaign for new grammar school buildings, in addition to the new high school; an effort to equalize both city and county taxes; a resumption of the old pre-war custom of holding an annual Rose Carnival, beginning in May of this year; and decided improvement in city beautification, street paving and lighting.

JAMES G. STAFFORD,
Secretary, Santa Rosa Chamber of Commerce.

Transforming a Dump into a Playground

GUELPH, ONT.—Thanks to the enterprise of the Chamber of Commerce, the city of Guelph has rid itself of an unsightly dump and acquired in its place an attractive playground for its children.



WHAT THE GUELPH CLEAN-UP COMMITTEE FOUND

During a spring clean-up campaign, Mrs. C. R. Crowe, Chairman of the Clean-Up Committee, reported the conditions on a triangular piece of ground in the part of the city known as Brooklyn, and suggested that the Clean-Up Committee convert it into a modern children's playground. The Chamber of Commerce got back of the plan, and many of its members joined with the Committee personally in clearing up the brushwood. The unsanitary and unsightly drains at the foot of the property were properly piped, and the area was filled in with earth brought from other parts of the city where the municipality was making excavations. Then on top was placed a layer of cinders, and the whole place was rolled and put into shape. Playground equipment was in-



AFTER THE CHAMBER TACKLED THE DUMP

stalled, including a box chair swing, a slide and a circular swing.

The Chamber has further plans for making the playground more park-like. Perennials have been planted in the corners of the park, and the willow trees that fringe the river's edge will be removed, to give a better view.

H. WESTOBY,

Secretary, Guelph Chamber of Commerce.

Oregon Town Builds 8,000-Foot Sea-Wall

SEASIDE, ORE.—Under the leadership of the Seaside Breakwater Association, a business men's organization of this city, a great concrete sea-wall has been built, at a cost of about \$150,000. This sum was raised by a bond issue. The wall is 8,000 feet long, with a 14-foot promenade.

Even before this development was completed, Seaside was the principal ocean resort on the coast of Oregon, and was visited annually by thousands of people. It is located on the Clatsop Beach branch of the Spokane, Portland and Seattle Railway, 18 miles south of Astoria and 118 miles from Portland. The Clatsop Beach branch is one of the few rail lines touching the Pacific coast of Oregon. This advantage of transportation, the natural excellence of the beach, and the construction development carried out at Seaside have combined to place this region among the leading Pacific resorts.

The original plans called for a promenade built of asphaltic concrete 4 inches thick, but this was later changed to a concrete walk 4 inches thick and of the usual sidewalk construction. A turn-around bay for automobiles was built at the foot of the main business street. This bay may be seen in the accompanying illustration. Considering the fact that the permanent population of Seaside is only a few thousand, this achievement shows remarkable enterprise on the part of the townspeople who undertook the development.

O. C. HAGMEIER, M. D.
President, Seaside Breakwater
Association.

New Auditorium Will Seat Three-Fifths of Town's Population

PLAINVIEW, TEX.—The total population of Plainview at present is less than 5,000; the municipal auditorium, on which work is rapidly progressing, will seat 3,000. It is believed that it is the largest auditorium to be found in any city of its size in the world.

The town sent seventeen men to represent it at the last Convention of the West Texas Chamber of Commerce, a commercial organization with a paid-up membership of nearly 7,000. When the question of the location of the 1922 convention came up, Plainview bid for it. The Convention immediately asked the Plainview delegation if they had a building large enough to hold a gathering of 3,000 to 4,000 delegates. The answer immediately came back, "No, but we will build you one." And the Convention took them up.

Plainview immediately set to work to back up its promise. A bond issue was carried by an overwhelming vote, and the work is now going forward.

In the main auditorium there is a stage 36 feet in depth, with an opening of 60 feet, a scenery loft and the necessary dressing-rooms. In the front of the building and on each side of the main entrance are two large rooms, one set apart for the Public Library and the other for the Chamber of Commerce. The arrangements for heating and ventilation are of the latest designs, and all modern conveniences are provided. The building is located on the main business street, sufficient ground having been purchased to allow parking on each side of the building.



NEW CONCRETE PROMENADE AND SEA-WALL, SEASIDE, ORE.



ARCHITECT'S SKETCH OF NEW MUNICIPAL AUDITORIUM, PLAINVIEW, TEXAS

A building seating 3,000 persons in a town of 5,000

The date set for the next Convention of the West Texas Chamber of Commerce is May 22. On that day Plainview is planning to entertain a gathering equal to its entire population.

R. P. SMYTH,
City Engineer.

A Prize-Winning Easter Egg Hunt

MUNCIE, IND.—The second annual Easter egg hunt in Muncie was held on Saturday, April 22, in McCullough Park, by the Dynamo Club of the Muncie Chamber of Commerce, which is composed of 110 of the young men of the city. All the children of Delaware County from the ages of 3 to 12 years were invited to participate in this event. About four thousand people took part.

Five acres of McCullough Park were reserved for the hiding of the eggs. Out of this space a section of approximately 600 square feet was reserved for the little tots from three to five years of age. There were 1,500 eggs hidden in the grounds reserved for that purpose. Out of that number, 1,250 bore prizes offered by the business men of Muncie. Each prize-bearing egg had a

sticker pasted on it with a number corresponding with the number of a prize.

The children were gathered in a section directly across from the territory where the eggs were hidden. At the ringing of a bell by Mayor Quick, all the children rushed across to the hunting-grounds. When a child found an egg bearing a number, he went to the prize booth, which was in charge of the Dynamo Club members, and got an order for the prize which bore the number corresponding to the number on the egg. No child could receive orders for more than one prize at a time but, after having received a prize, could go back and hunt for more eggs.

Because quite a number of the children usually stray away from their parents, the Dynamo Club had a booth to which all the lost children were brought and where any parent could claim his or her child. This booth was in charge of the Boy Scouts, Girl Reserves and Dynamo Club members.

This hunt has proved to be a great success in the way of affording pleasure to thousands of people, of creating community spirit, and bringing into direct contact the city and country people of Delaware County.

E. H. HYMAN,
Manager, Chamber of Commerce and Commercial Club.

There were 508 less fires and 122 less false alarms in Detroit in 1921 than in 1920. Also, the fire loss in this city was approximately \$1,000,000 less.

Municipal Water Rates—Part III

[A Thorough Analysis of Present Rates and Rate-Making

By E. E. Bankson, D. E. Davis and C. A. Finley *

A Proposed Method for Distribution of the Burden

THE usual assumptions underlying the construction of rates are that the total revenue to be derived may be divided into three broad classifications which roughly correspond to the costs. These are the consumer costs, demand costs, and output costs. The consumer costs are taken as those costs (actually derived from a study of the company's books) which cover the reading of meters and billing of charges, bookkeeping costs, stationery, and those costs which have no reference to the quantity of water used by the consumer, but which are practically the same for each consumer regardless of size.

The demand charge in bulk is assumed to cover such costs as have to do with the possible peak load demands on the plant, such as fires or sudden large momentary uses of water. Since the investment in nearly all elements of the plant, including the distribution system, is necessarily much greater, in order to care for peak loads, than would be true for uniform, non-fluctuating loads, it has usually been assumed that all charges connected with the investment, such as interest charges, are included in this category. A portion of the time of certain executive officers is also thought of as being properly chargeable to this account. Having determined the bulk figure, the distribution to the individual consumers is usually effected by finding the total "capacity" of the individual consumers on the assumption that the area of the service lines or meters supplying the property is a fair measure of the demand which the consumer may make upon the system. When this individual capacity charge is found, it is usually combined with the "consumer charge" in order to form a "service charge" usually based on the size of meter. In practise the strict application of the theory is usually considerably modi-

fied by the introduction of a more or less arbitrary diversity factor.

The "output charge" covers such costs as fuel, labor of station employees, chemicals, etc., and varies strictly with the quantity of water pumped. The larger the pumpage, the lower this cost.

There is little dispute as to the fact that these three general classes of costs do apply in a water-works plant, and the only divergence of opinion will arise as to their derivation and constitution, and their equitable distribution into a rate schedule, when once determined. It is in the desire to stimulate further discussion of this problem and in the hope that ultimately a more-or-less standardized method of procedure may be derived and agreed upon, that this discussion has been undertaken.

When the foregoing premises are examined, little objection can be suggested to the methods employed in arriving at or in distributing the "consumer charge" or the "output charge," but when the "demand charge" is similarly examined some of the present methods appear open to question on both counts. It may as well be conceded at this point that no hard and fast rule may be employed in the making of the final rate, and that considerations other than those dictated by pure theory must oftentimes be consulted in arriving at the final determination. The making of a rate involves judgments of a judicial character, and questions of expediency often modify the rate derived from a disinterested study of the conditions at the plant. However, in the building of the rate it will probably be conceded that reasonable assumptions corresponding as closely as possible to the known conditions of the plant should be employed. There are several premises in the methods used in deriving and distributing the "demand charge" which appear to the writers not to correspond with the ordinary observable conditions of plant operation.

What are these conditions which are common to all plants and are a matter of every-day acceptance in their operation?

* E. E. Bankson, of The J. N. Chester Engineers, Pittsburgh, Pa.; D. E. Davis, of The J. N. Chester Engineers, Pittsburgh, Pa.; C. A. Finley, Managing Engineer, Bureau of Water, City of Pittsburgh.



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And after all is said and done, the grind of every day traffic isn't a starter to the tests the General Chemical Company engineers gave the Hard-n-tyte Road Treatment before they ever recommended it to highway engineers.

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crystal form. These crystals are dissolved in water as needed and the solution flushed over the surface of the concrete—common labor does it quickly and cheaply. The fluorides and silicates formed are absolutely insoluble in water, unaffected by weather and extremely durable under the grind of traffic. Hard-n-tyte forms a flint hard surface that will wear for years like mosaic.

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Hard-n-tyte Road Treatment

—makes concrete roads wear longer

As to the physical aspects, they are essentially these: The plant at a given time furnishes an average daily quantity of water which remains fairly constant from year to year. There is, however, a very wide variation in the consumption during any one day, the minimum being at night, and the maximum usually about 10:00 A. M. There is also a seasonable variation; the summer demands and the winter peaks usually exceed considerably the average consumption. Finally, each plant recognizes the possibility of a set of circumstances which may put a very heavy demand on the plant for a brief period, and in addition to these considerations, there is always the possibility that the plant may be called upon to supply water for a heavy conflagration.

On the back-of-the-counter side of the water-works office there is another factor which can be counted upon with the same degree of certainty as the average annual consumption. This is the assurance, built up during a long association with the conditions of water-works practice, that the consumers can be depended upon to continue their use of water, and consequently that the money will come over the counter in a fairly uniform stream from year to year, the growth of the population being taken into consideration.

These are well understood characteristics which are common to the personalities of all plants, but in the casting of many rates these conditions have not had an opportunity to reflect themselves, having been replaced by theoretical assumptions which do not correspond with the facts.

The justification for the service charge as advanced by its advocates starts with the idea that the utility must meet certain fixed and administrative charges whether water is delivered to the consumers or not. It is implied, therefore, that there should be a certain stated charge made against each consumer over and above the charge for water, and that this should apply whether any water is used or not. This idea seems to be entirely reasonable when properly applied, because there are certain investment charges applicable against the consumer's specific installation for which the utility should receive adequate return in the rates secured from him, and which conceivably a charge against consumption alone would not always cover. However, the strict application of the usual theory would

build up such a large service charge as to make this portion of the consumer's bill the largest item in the case of the majority of consumers. This would be true because in the ordinary case most of the fixed charges are thrown into this item. After the fire protection charge to the city (which is chargeable against this item) is taken out, the amount still levied upon the consumer is high.

The fallacy in this premise—or so it appears to the writers—lies in the assumption that the whole of the fixed charges should be placed in the demand classification. This idea neglects the obvious fact that the plant is constructed not only for a large demand but primarily for day-to-day service to consumers. Furthermore, the habits of the consumers are fairly well established and quite constant. The assumption that they as a body will suddenly cease to use water, is strictly opposed to the facts; the revenue, however the rate is formed, has the habit of coming into the office with due regularity.

All that the utility can reasonably expect is that a sufficient charge in the form of a service rate be assessed against the consumer to cover the legitimate costs of investment assessable against him, so that if for some reason, such as absence on vacations, his consumption becomes abnormally low, there will still be enough revenue derived to carry his account.

To point out other apparent defects in the present theory and to suggest possible remedies, it will be necessary to enter into a discussion of some of the details of rate-making. Admitting that the element of judgment must enter into the determination of the form of the rate finally adopted, it certainly will be desirable to fix limits within which this function may operate. In order to fix the lower limit, it will be convenient to inquire as to what would be the minimum investment required for supplying the water to consumers.

It is obvious that the absolute minimum investment would be the one in that plant which would be required to work regularly, uniformly and continuously for 24 hours per day, 365 days per year, delivering the total required quantity, but uniformly, and not as at present—as demanded. Such a condition might be conceived if each consumer were thought of as having a storage tank which would equalize all of his fluctuations and into which the utility would deliver



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The "Caterpillar's" field of usefulness is by no means limited to the lighter jobs. There is a "Caterpillar"* of size and capacity for every power need. On farm or ranch, in the mining, oil and lumber industries, for snow removal and other civic work—wherever power and endurance are at a premium, the "Caterpillar"* has no real competitor.*

Whether used in grading, scarifying, ditching or maintaining streets and roads, removing snow, or hauling refuse disposal trains, the power and endurance of the "Caterpillar"* Tractor enables it to do the most work for the least money. Akron, Ohio, Bureau of Public Works, after comparing the performance of "Caterpillars"* and teams on street grading, found the "Caterpillar"* method far more economical. Denison, Texas, did more grading in the first six months it owned a "Caterpillar"* than was done in six years with teams. New York, Minneapolis, Richmond, Va., and many other progressive cities and towns now use "Caterpillar"* power to reduce the cost of public works. Upon request we will arrange to show motion pictures of "Caterpillars"* in municipal work.

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water at a uniform rate. Obviously, the plant investment for this arrangement would be much less than for the plants actually erected, and this condition would extend from the pumps to the filters, buildings and distribution system and would include some reduction even in the size of the consumer's meter and sometimes his service line. This would be the absolute minimum for a plant which would render average day-to-day service, and it is our belief that at least this much of the investment (and probably more) will be required for ordinary service. The utility could not get along with less.

If this be granted, and if it is also conceded that the principal reason for the existence of the plant at all is the serving of the daily needs of the consumer, it would seem that this much at least of the fixed charges on the plant investment is chargeable directly against the consumption, since in such a plant the summation of all consumptions (or total annual consumption) when divided into the total fixed charges would represent the price per unit which, when applied to the consumption of each consumer, would fix the proportion of the whole cost which he should bear. This charge, then, is strictly proportional to the actual average consumption. Contrary to the usual practice, it would then seem that this cost should be made a part of the output charge, which is made on the basis of actual consumption of water.

A good example of a minimum plant as regards the water-supply element in plant investment would be a gravity supply with a reservoir large enough to supply all deficiencies in stream flow. Any hourly or day-to-day fluctuations in load would affect such a large reserve not at all; the same reservoir would be required whether the consumptions were uniform or fluctuating, and the fixed charges against a storage reservoir would therefore appear entirely in the output charge.

Having now allocated into "output charge" certain elements of cost which in the past have been considered as applicable to "demand" and have been made up into the "service charge," there remain certain costs which admittedly should be included under the "demand" heading. A suggested method of dealing with these costs will now be discussed.

The method proposed is that of splitting up the plant investment into various cate-

gories representing like service, such as pumping station and accessories, filtration plant, reservoirs, carrying mains, gridiron distribution system, and services and meters. This having been accomplished, the next step involves a study of the probable relation between the normal use and the maximum demand on each element. This may best be illustrated by example.

An examination of the pumpage record of the plant is made and the average daily pumpage determined, as is also the maximum hour's pumpage at any time during the year. If a record of pumpage during a heavy fire can be found, this is also recorded, or else the maximum pumpage possibilities of the plant are used. Assume that the results are as follows:

Average daily pumpage rate...	1	mil. gals.
Maximum hourly pumpage rate	2	mil. gals.
Fire rate	2½	mil. gals.

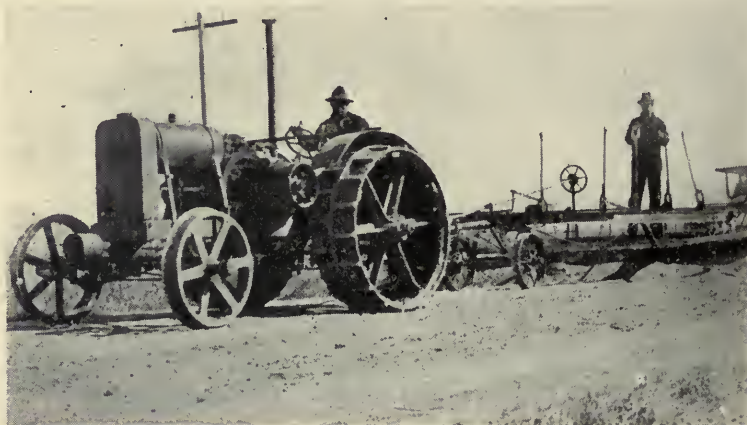
Then for convenience the investment costs

	I	
would be broken up	—	to output charge,
	2.5	
2-1	.	2.5-2
—		to demand charge and —
2.5		2.5
		to fire

protection service. A little consideration of the activities of the average water-works plant will indicate that there may be and usually is a wide variation between the demands of the various elements of the plant. These will also vary with the size of the plant; the larger the plant, the smaller the variation. The greatest fluctuations will occur the nearer the consumer is approached, and the diversity factor or ironing-out effect becomes more pronounced the nearer to the source of supply.

It is practically impossible and really unnecessary to determine the actual demand of each consumer, but it will be sufficiently accurate to consider the different classes of consumers based on the sizes of their meters. As a measure of the demands of various consumers we have employed the study of this subject as made by the committee on meter rates for the New England Water Works Association which appears in the December issue of the 1916 *Journal*. The entire fixed charge on all meters is first allocated to the various groups of meters, and the amount to output and to demand is fixed by reference to the relation between average use and maximum demand. It is assumed for convenience that the in-

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HYPOTHETICAL WATER COMPANY, 50,000 POPULATION—APPORTIONMENT OF CHARGES

	1/8"	1/4"	3/8"	1/2"	3/4"	1"	1 1/4" & 1 1/2"	2"	3"	4"	6"	Total
Meter Sizes												
Number of Consumers	840	379	69	68	27	17	12					9,162
Number of Meters	7,750	3,846	74	75	32	20	14					9,261
Annual Consumption:—Mil. Gals.	414	114	54	118	208	248	348					3,629
Average Consumption per Meter—Gals.	53,000	135,000	327,000	730,000	1,575,000	24,400,000	24,900,000					163,000
Fixed Charge on Meters	\$10,500	\$154	\$910	\$343	\$287	\$362	\$644					\$13,417
Ratio: Output 38 Demand 134, Fire 0	116/705	580/7200	1700/2050	11/35	55/76	111/139	9/13					3,800
-Distribution to Output	1,728	75	735	244	207	180	445					3,800
xDistribution to Demand	8,772	79	155	94	80	182	199					9,617
xRepairs to Meter—Demand	\$16,000	183	1,085	408	342	431	767					16,000
Fixed Charge on Gridiron	32,165											15,450
-Output and Demand	13,070	1,414	640	116	46	29	20					15,450
xDemand	6,870	832	426	77	30	20	14					8,347
oFire	6,200	582	214	38	16	9	6					7,103
Fixed—Reservoirs and Supply Lines												16,715
-Output and Demand	50,590	2,470	2,710	1,175	2,560	4,510	5,380					35,340
xDemand	4,495	1,370	1,690	840	1,830	3,220	3,850					22,675
oFire	4,495	1,100	1,020	335	730	1,290	1,530					12,665
Fixed—Pumping and Filters												15,250
-Output and Demand	57,130	2,400	3,950	1,705	3,725	6,570	7,830					51,417
xDemand	9,320	2,400	2,820	1,310	3,100	5,480	6,530					40,100
oFire	3,735	1,200	1,130	395	625	1,090	1,300					11,317
xBilling, Collecting, Etc.	14,920	1,365	617	120	121	52	23					14,920
-Operating Expense	116,400	8,150	8,930	3,860	8,430	14,880	24,880					116,400
Totals:—	37,678											71,622
oFire	71,622	4,509	4,221	1,203	2,016	2,870	4,992					71,622
xService	191,322	12,827	14,621	6,249	13,686	23,517	39,859					191,322
-Output	\$300,622	\$17,236	\$18,842	\$7,452	\$15,702	\$26,687	\$31,784					\$262,944
Average Price per M. Gals.	\$100,200	15,360	15,100	13,300	13,300	12,800	12,800					16.40
Service	\$618	\$6.33	\$11.00	\$16.30	\$26.90	\$80.00	\$7.73					\$7.73
Output	.126	.113	.117	.116	.116	.115	.114					.118
Final Rate Adopted:												
Service	\$6.00	\$8.00	\$10.00	\$13.00	\$20.00	\$50.00	\$200.00					\$7.17
Straight Output Charge of	.12	.12	.12	.12	.12	.12	.12					.12



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SMALL WATER COMPANY—3,500 POPULATION—APPORTIONMENT OF CHARGES

	5/8"	3/4"	1"	1 1/4" & 1 1/2"	2"	4"	Total
Meter Sizes							
Number of Consumers and Meters.....	626	4	9	3	2	1	645
Annual Consumption—Gals.....	14,533,600	508,700	7,194,400	1,957,600	5,887,300	6,871,600	36,973,200
Average Consumption per Meter—Gals.....	23,250	127,200	800,000	652,500	2,943,600	6,871,600	57,300
Fixed Charges on Meters, Etc.....	\$1,711	\$17	\$36	\$23	\$17	\$25	\$1,829
Ratios—Output 19, Demand 100, Fire 0.....	116,705	580/1200	1700/2050	11/35	55/76	20/40	19,100
-Distribution to Output.....	282	8	\$30	\$7	\$12	\$13	\$352
xDistribution to Demand.....	1,429	9	6	16	5	1	1,477
xRepairs to Meters, etc. (Dem).....	307	3	6	4	3	5	328
Fixed Charge on Gridiron.....	5,363						
-Output.....	2,705	17	40	13	9	4	2,788
xDemand.....	1,240	10	27	8	6	2	1,473
oFire.....	1,285	7	13	5	3	2	1,315
Fixed—on Stand-Pipe, Force and Carrying.....	3,850						
-Output.....	1,062	37	523	143	428	502	2,695
xDemand.....	483	19	291	89	285	358	1,525
oFire.....	579	18	232	54	143	144	1,170
Fixed—on Pumping Plant and Filters.....	8,839						
-Output.....	2,608	92	1,290	351	1,057	1,232	6,630
xDemand.....	1,630	58	862	234	755	880	4,419
oFire.....	978	34	429	117	302	352	2,211
xBilling, Collecting, Etc.....	2,047	13	29	10	6	3	2,047
xAdministration, Etc.....	3,000	35	399	112	319	372	3,000
-Operating Expenses.....	9,939	137	1,935	527	1,585	1,850	9,939
oFire.....	5,940						5,940
xDemand Service.....	11,548	119	1,113	318	781	890	11,548
-Output.....	17,708	232	3,145	865	2,643	3,103	17,708
	\$35,196	\$351	\$4,258	\$1,183	\$3,424	\$3,993	\$35,196
Average Cost per M. Gallons.....	\$1.10	\$.69	\$.59	\$.60	\$.58	\$.58	\$.95
Service Charge.....	\$13.80	29.80	123.80	106.00	390.00	890.00	17.90
Output.....	.53	.46	.44	.44	.45	.45	.48
Final Rate—4000 per Q. @ 55c, all over @ 45c + Serv. Charge of	15.00	35.00	125.00	200.00	360.00	600.00



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vestment in an "average" meter and in the actual meter in use (which is large enough to supply the maximum demand) will be proportional to the demands in each case. The cost of repairs to meters probably bears a close relationship to the investment in meters, and this cost is distributed between the classes of meters in proportion to the investment.

A fair basis for distributing the costs of the gridiron system is next sought. It is believed that the fairest basis is that found by assigning the costs directly on the basis of the total number of consumers. A more or less arbitrary distinction must be made between carrying mains and gridiron system, the former representing in this discussion the large arteries emanating from the plant, which carry water out to distant districts and to which the smaller mains connect to distribute the water to the consumers themselves.

The size of the gridiron lines is largely dictated by friction loss considerations, it being necessary for the lines to be large enough to furnish fire streams without undue pressure loss. The mileage in these mains has little reference to actual or relative consumptions, but they are made necessary by the fact that the population lives in homes that are scattered over a wide area, and by whose properties water lines must be laid in order to render service. The investment in these lines varies more nearly with the population than with consumption, as such, and it seems fair then to consider that the investment in gridiron system is the same for each consumer. That it probably does not vary with consumption directly, might be seen if it were assumed that in a given plant one large industrial consumer, located near the plant, used as much water as all the remaining population, yet this fact would make little difference in the mileage of mains; they would be required in any event in order to supply the remaining consumers. Any increase in consumers involving building up of new territory would require proportionally greater mileage.

In the distribution of this burden the fire protection charge would ordinarily take the largest share of the cost, and the distribution of the remaining costs between "output" and "demand" would be made with refer-

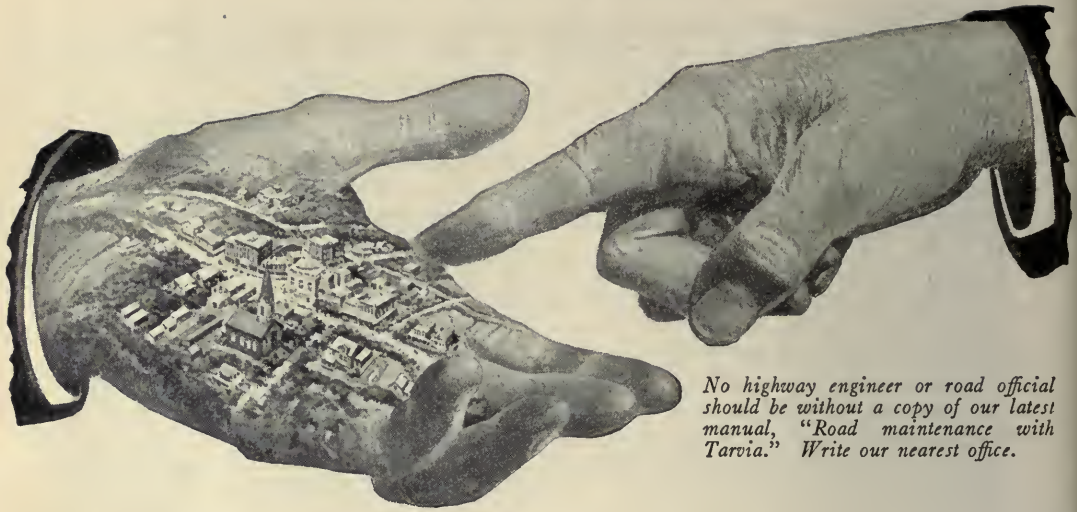
ence to actually observed demands on various parts of the system where records were available. The further distribution as between individual classes of consumers would have to be a question of judgment, but the limits would probably be fairly well defined. The tabulation on the preceding pages, in which a complete example is worked out, will explain the method in greater detail. The ratios for each division, having been obtained by observation of actual conditions for this plant, are distributed to the different classes of consumers by methods similar to that for meters.

The consumptions of the various classes of consumers are probably the best basis upon which to distribute the fixed charges on carrying mains, after a figure has been arrived at for charge to fire protection. In a majority of cities the consumption, both large and small, may be distributed at various, widely scattered locations throughout the city. The carrying mains must be large enough to supply these maximum collective demands or consumptions.

Since the quantity of water to be delivered at various controlling areas, not necessarily influenced by distance alone, is the basis for the design of the carrying mains, it would appear that the money that went into its construction would bear a closer relation to the consumption than to any other feature. The ratio between the average daily use and the maximum demand becomes less as the source of supply is approached, and the ratios in the carrying mains are less than in the gridiron.

The consumption basis for the distribution of costs has been used in each of the remaining classes of service, with the exception of "consumer costs," where such items as bookkeeping, billing, reading meters, etc., has been distributed directly in proportion to the total number of consumers, and the result carried into the sum which later forms the "service charge."

Having assembled the "demand" and "output" charges for all consumers on the same sized meters, the average output charge is found by dividing the total output costs by the total annual consumption for that class, and the "service charge" by dividing the corresponding sum by the total number of consumers in that class.



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Boiler Cleaners for Municipal Power-Plants*

By W. F. Schaphorst, M. E.

IN a previous article the writer has stated that the principal losses in municipal steam power-plants occur in the boiler room. It is easier to save money in the boiler room than in the engine room. Volumes are written about engines, and thousands of dollars in premiums have been paid for engines that will develop a given horse-power and save perhaps 5 per cent of the steam ordinarily consumed. Yet, out in the boiler room, and because of sheer neglect, it is costing much more than it should to generate that same steam. Attendants in the boiler room should always be on guard to prevent heat losses up the "waste-basket of the power-plant"—the chimney, as that is where most of the lost heat goes.

Among his other duties the boiler attendant (which means the fireman in the smaller municipal plants) must see to it that the boiler heating surfaces are always kept clean inside and outside. Cleanliness is essential in attaining high efficiency and capacity. Boilers must be taken out of service regularly to be repaired and cleaned. The two principal offenders that will cause huge losses unless kept off the heating surfaces constantly are scale and soot.

Scale Removal

It is authentically reported that in a series of 120 tests by the Illinois Central Railroad 11 per cent greater mileage was obtained from locomotives during the month after freeing the boilers from scale than was obtained during the three months previous to cleaning. This is equivalent to a saving of 11 per cent of the fuel. In similar tests by other concerns, savings range all the way from 8 per cent to 16 per cent. In a series of tests performed by Professor Schmidt of the University of Illinois on locomotive tubes covered with scale in thicknesses varying from zero up to 1/9-inch, it was found that heat losses vary from zero at zero thickness to 16 per cent

at a thickness of 1/9-inch. After a thick scale is once formed, added thickness does not make much difference. The important point is—take all of the scale off and take it off frequently.

Periodical scale removal is desirable for other reasons besides economy. Scale is often directly responsible for the overheating and burning out of boiler tubes when operating at heavy loads. At light loads a given thickness of scale may be harmless, the heat being transmitted without trouble. When the boilers are forced, however, the temperature of the boiler shell naturally increases, often to such an extent that the scale adjacent to the shell becomes dry. When dry, scale is a more effective heat insulator than when wet, and as a result there is grave danger of overheating and burning the shell or tubes. It is not uncommon in plants where the scale menace is lightly regarded to retube boilers completely every two or three years. With proper care, tubes should last nearly as long as the boiler itself. It is cheaper to clean old tubes than to buy new ones.

There are thousands of engineers and owners of plants throughout the United States who are still ignorant of the scale problem—who do not even know that their boiler tubes are coated with scale. One manufacturer writes: "In 75 per cent of the reports to us the officials or engineers claim that they have no scale or are using water which does not produce scale. Yet it is a well-known fact that artesian well water is highly impregnated with scale-making properties. In other words, because the water is clear and safe for drinking purposes and shows no muddy deposit, they seem to think that it is free from scale properties. There are thousands of plants where no attention whatever is paid to scale, yet every little while they find it necessary to retube their boilers and they simply put that down to wear and tear." Rain-water, snow-water and distilled water are about the only waters that do not produce a serious amount of scale in boilers.

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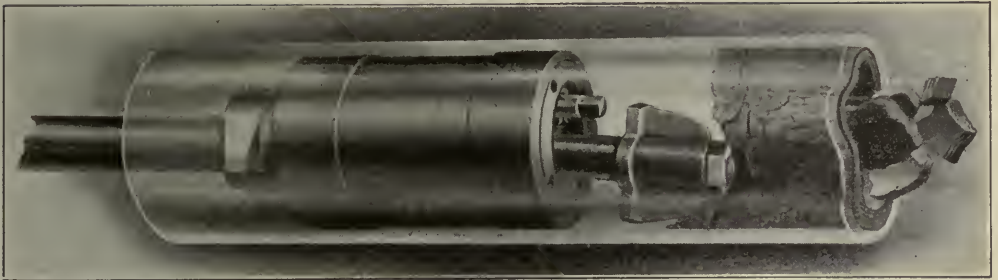
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Lighting Standards

WEST ALLIS, WISC., has recently put in service an ornamental street lighting installation in which the standards are made strong enough to support the trolley wires. This and other types of Hollowspun reinforced concrete lighting standards are described in Catalog Supplement No. 9.

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A VIBRATORY SCALE REMOVER OPERATING IN A WATER TUBE BOILER

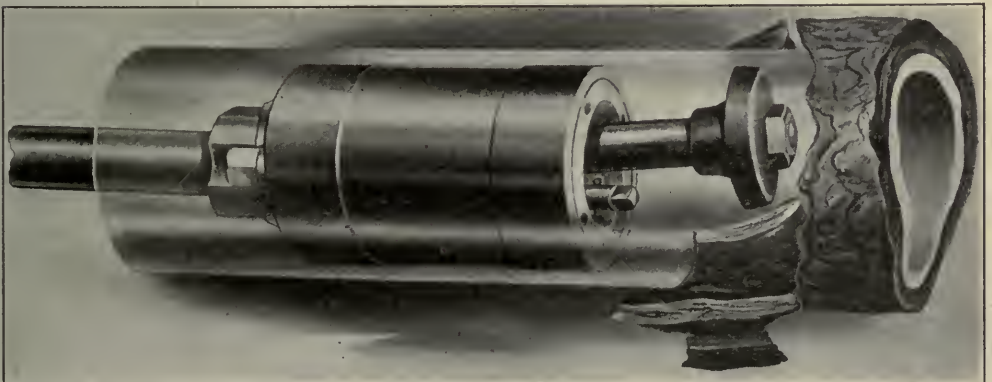
Some Doubtful Cures

Boiler compounds for the treatment of scale are too frequently used in boilers. Compounds often seem to serve the purpose, but they are unreliable. One can never be certain that all of the scale is loosened, or treated, because of the naturally varying thickness of scale throughout the boiler. The first cost of compounds is usually high, and in addition there is the cost of damage done to the boiler in one way or another. Many compounds contain acids, such as muriatic, tannic, or acetic, and all these acids attack iron. Professor Marks says in his *Mechanical Engineers' Handbook*: "General corrosion * * * is also caused by the action of certain boiler feed-water compounds containing tannic acid, sulphate of copper, etc. * * * Great caution should be exercised in the use of such materials in boiler practice." If compounds are to be used at all, a good rule to follow is to avoid all secret compounds. They are liable to be bad enough even when the chemical composition is known. Even soda ash, very frequently used and recommended,

may be the cause of corrosion, and there is no question that it often causes foaming troubles.

Graphite is also commonly recommended and used for keeping the scale off the heating surface of boilers. The method is to first remove the scale thoroughly and then apply graphite to the heating surface. It is claimed that scale will not adhere readily to the graphite. Then, as long as the boilers are in use, graphite is injected into the boiler so that it will mix with the scale and make it soft and easily crumbled. Preparations using graphite as a base and operating similarly are also on the market. While graphite and kindred preparations do not attack or harm the boiler metal, without the use of mechanical tools the engineer can never be positive that these substances are working effectively. Further, the continual injection of graphite into a boiler and its collective adherence to the shell and tubes may of itself eventually become a menace.

Kerosene and crude oil are also pet "cures" used by some engineers to over-



Courtesy W. P. Pierce Company

VIBRATORY SCALE REMOVER OPERATING IN A FIRE TUBE BOILER



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come scale troubles. These oils are injected directly into the boiler, and in certain cases they are apparently beneficial. Their use should be discouraged, however, because the lighter oils will always distil off, and thick, gum-like greases are left behind, which adhere to the heating surfaces and are, according to some authorities, more effective in retarding heat transfer than is the scale itself. In extreme cases the grease settles to the bottom of the boiler, where it combines with the scale and mud and insulates against heat transfer so effectively that bags or blisters are formed in the boiler shell. Oil and grease should be kept out of boilers just as carefully as scale is kept out. The only thing the fire can do is to heat the boiler shell, making it very hot—sometimes red-hot. If the boiler is under pressure when the shell is red-hot, it is quite natural that the shell should bulge, or "bag," as it is usually called, at the place where it is hottest. Bagging is bad, for it may be the forerunner of a disastrous boiler explosion. Foaming is also sometimes caused by oils because of the minerals they contain. The minerals are liable to be converted into a soapy substance if the feed water is alkaline—also conducive to explosions.

In the United States and Europe, low water is the most common cause of boiler explosions, but carelessness of attendance is also largely responsible. Sometimes experts cannot decide whether an explosion was due to low water or to carelessness, but they all agree that oil and grease are about as much of a boiler menace as is scale and all three should be kept out. They all cause explosions.

It should be borne in mind that after grease once gets into the boiler water it is very difficult to extract. About the only way in which it can be removed perfectly is to distil the water, leaving the grease residue. This method, of course, would be too expensive, and so we must resort to modern mechanical filtering devices. With these devices, when steam first leaves the engine it is whirled through a separator, where most of the grease is extracted by means of centrifugal force and the striking of the grease particles against the separator walls. Then the steam is condensed, and the condensate is forced by pumps through filters of some kind or other, which remove

most of the remaining grease. The cleansed water then reenters the boiler. To be sure, every trace of oil is not removed. The writer knows of no manufacturer who will guarantee to remove every bit of grease and oil year in and year out. There are successful systems on the market, though, that cleanse the water to the extent that it is no longer harmful.

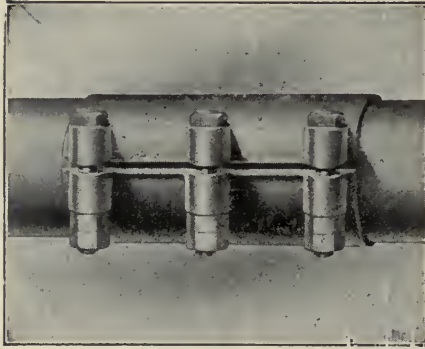
Steam turbines have an important advantage over steam engines in the matter of condensate cleanliness, for the exhaust from turbines is always clean and free from oil. In turbines oil does not commingle with the steam, because lubrication is not required; the blades and other internal parts in the turbine do not rub against other metallic parts—there is no metallic friction.

Even though compounds, graphite, kerosene, etc., assist in loosening the scale, the scale still remains in the boiler. To remove this scale, frequent blowing out of hot boiler water is necessary, and hot boiler water is expensive. Even then, all of the scale is not removed. These scale-removing materials, when doing their best, are therefore only partially effective.

Mechanical Scale Removal

In former years, before the invention of mechanical cleaners, it was necessary to chip out boiler scale by hand, with a hammer and chisel—a very expensive process. As a result, boilers were not cleaned often enough. To-day we have power-driven cleaners operated by steam or compressed air, which do the work quickly, inexpensively, and thoroughly.

There are two types of mechanical cleaners on the market—one rotary and the other vibratory—from which the municipal authority will doubtless make his selection when the time comes to purchase a scale remover. The rotary cleaner contains a number of sharp cutters resembling grindstone dressers, which rotate rapidly on the end of a shaft and are thrust against the scale by centrifugal force. These cutters virtually bore their way through the tubes. The rotary cleaner is used a great deal and, although not always thorough, it is far superior to the hand method. If the scale is extremely hard, it is difficult to get it all out with the rotary type of cleaner, but the soft, spongy top layer can be easily removed. One more or less serious objec-



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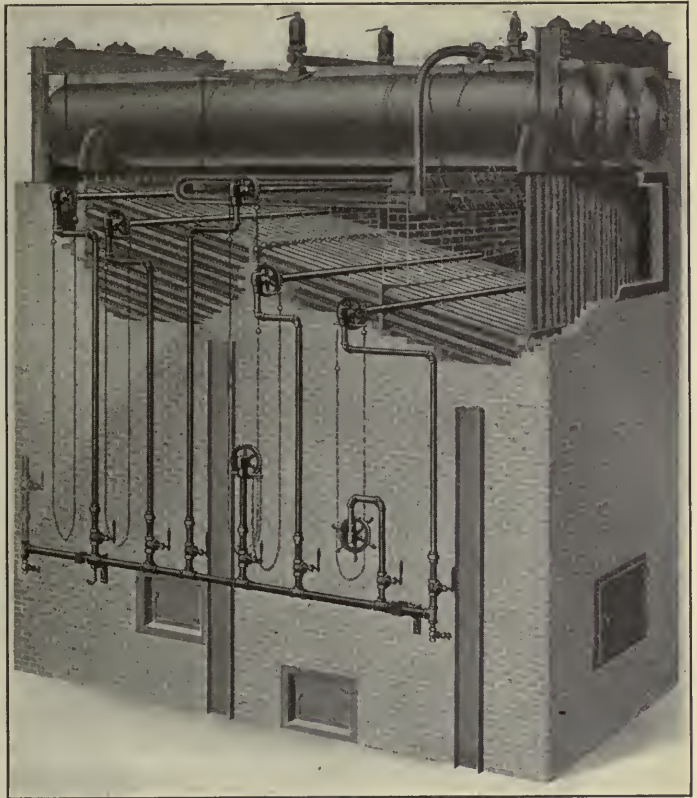
MEDART

tion to the turbine type of cleaner is the rapidity of wear of the cutter heads and the high cost of replacements.

The vibratory method is usually more thorough, as it does not leave a thin, hard layer next to the metal. The vibrator will usually remove more scale from tubes that have just been turbinized. Wear on the vibrator is insignificant, and this type is therefore more durable; the upkeep cost is less.

The vibratory cleaner should not strike the tube too hard, but provision should be made for absorbing the shock. This type of cleaner is usually operated on the principle of the steam engine and is driven either by compressed air or by steam at varying pressures. The pressure to be used depends upon the character of work to be done. The vibrator is moved back and forth at rates ranging from 3,500 to 10,000 times per minute. This rapid tapping of the vibrator sets up corresponding vibrations in the elastic steel tube, which alternately elongates and flattens, in section. Scale is not elastic and cannot bend and vibrate in unison with the steel tube, hence it is quickly loosened. Ten to thirty tubes may be cleaned per hour, depending upon the character and thickness of the scale. This principle of cleaning may be successfully applied to cleaning all kinds of water-tube boilers, straight or curved tubes, condenser tubes, evaporator tubes, and superheater tubes.

The vibratory cleaner has another advantage when applied to water-tube boilers, in that while removing scale from the inside of the tube it simultaneously shakes the soot off the outside. This is particu-



Courtesy Vulcan Soot Cleaner Company

MECHANICAL SOOT CLEANER APPLIED TO HORIZONTAL WATER TUBE BOILER

larly valuable where the soot is exceedingly hard.

Soot Removal

In addition to the removal of scale, the other arch enemy of high efficiency—soot—must also be constantly removed. It is about the best heat insulator known. The insulating value of soot is five times greater than that of asbestos.

The principal reason why soot is so uneconomical is that it gets in between the fire or hot gases and the boiler shell or flue. That is the very position in which there should be no insulating medium at all, because that is where an insulator can create the greatest fuel loss. It has been shown in carefully conducted tests that an insulator between water and metal is not so effective as between gas and metal. Hence, a given thickness of soot on the outside causes far greater loss than an equal thick-

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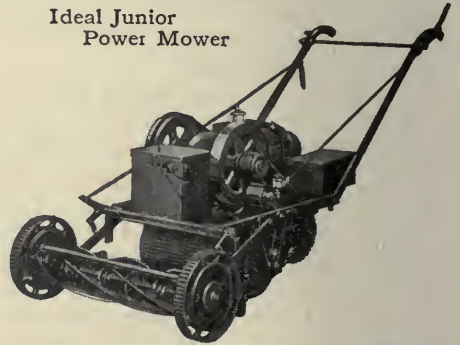
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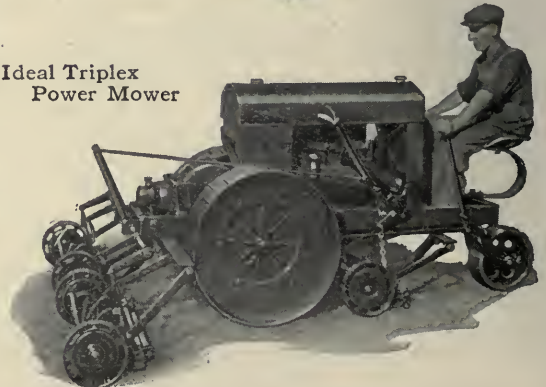
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ness of scale inside a boiler. Soot shuts off heat at the very source. It does not permit the heat to even touch the metal of the boiler.

Soot is not only a creator of inefficiency, but at the same time a reducer of boiler capacity. By keeping soot off boiler and flue surfaces, a boiler can be "forced" with better effect than where soot is permitted to accumulate. This can easily be proved by taking temperature readings of the flue gases. Tests have proved time and again that where soot is consistently cleaned off in a thorough manner, the average flue gas temperature is materially reduced. Boiler efficiency can be estimated with surprising accuracy by merely taking the flue gas temperature.

Relationship of Soot and Scale

Not many engineers realize or give thought to the fact that there is a relationship between soot and scale. One is a sort of complement of the other. Where one of them is to be found, the other is more or less lacking. For example, engineers sometimes wonder why it is that thicker scale is to be found on boiler tubes close to the outside wall than close to the inside wall. The reason, which is easily explained, emphasizes the importance of thorough mechanical boiler cleaning in preference to cleaning by hand.

It is plain to anyone that the tube that absorbs the most heat will evaporate the most water, and therefore will leave the most scale to cling to and impair the heat-transmitting qualities of the tube; hence the thicker scale on one side of the tube bank than on the other. On examining these boilers it is invariably found that by the hand method the soot is blown off the tubes through the dusting doors at the sides of the setting. A hand lance thrust through the dusting doors does not clean the far side of the boiler. Instead of cleaning the tubes on the far side, it blows the soot from the near side over onto the tubes farther away and makes matters worse there than before. In some cases it has been found that tubes have been packed completely full of soot and they might just as well not have been in the boiler at all.

By using mechanical cleaners rather than the hand lance, an average saving of about 5 per cent of the annual fuel bill is effected. One reason for this is that with mechanical cleaners it is possible to remove the soot three or four times every day.

In too many municipal plants the old hand lance method of cleaning is still used. The hand method is inferior in many ways and should not be continued. Take, for instance, the matter of velocity of steam. It is practically impossible for the hand lance to give a sufficiently high steam velocity, because of the great internal friction of the lance and the connecting steam hose. High velocity is essential for thorough cleaning.

In practice it has been found that high-velocity steam jets will often clean tubes without even touching them, because of their "injector action." They set up high-velocity air or furnace-gas currents. These currents of gas scrub the boiler tubes and clean off the soot.

Hand cleaning is undesirable also because the boiler must be opened while cleaning, permitting cold air to rush in and cool the boiler-heating surfaces. Some types of boilers cannot be cleaned by hand at all while in operation, but must first be shut down. To shut down a boiler is expensive. How can we tell when a boiler needs cleaning, internally, externally, or both? By keeping a weather eye on the chimney gas temperature. The lower the temperature, the better. High temperatures should not be permitted. Just as soon as a certain high temperature is reached, that is the time when the boiler should be cleaned.

One engineer made it a practice to clean his tubes as soon as the chimney temperature reached 550 degrees. He found that by so doing he cleaned the tubes an average of three times in 24 hours, so he decided to make it a rule to clean the boilers every 8 hours, regardless of chimney temperature. Another engineer, under different conditions, found that it was best to clean his boilers at a temperature of 575 degrees. He very likely had a dirtier coal, because the temperature rose quickly again and he found that on an average he had to clean his tubes four times per day of 24 hours.

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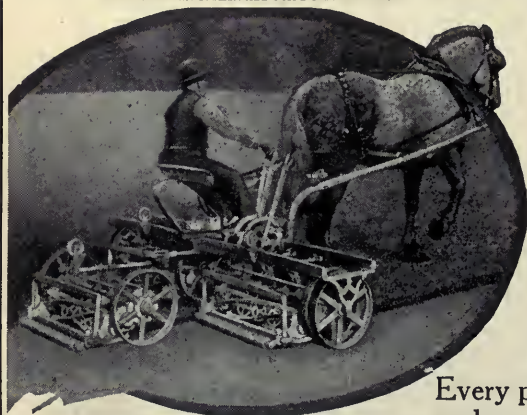
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Increasing the Flow from Drilled Wells

Methods Used in Shooting Oil Wells Now Applied to Deep-Well Water-Supplies

WHERE blasting is possible in the outlying districts of a city or in readily defined well fields, the use of dynamite cartridges in increasing the flow from drilled wells has become quite common practice. A very careful study must be made of the quantity of water in the earth or rocks surrounding the bore hole, the character of the formation, and the rainfall. Most of these data may be secured from the United States Geological Survey and the Weather Bureau. Firing the blast at the bottom of a well in sand or gravel has practically no effect on the flow of the well, for after the explosion the sand or gravel simply settles back into its original place in the porous mass. If sunk in water-bearing rock, the well may draw only from the particular pores and crevices which it intersects. By shattering a larger area with a heavy charge, the sectional area as a whole is increased and radiating fissures created through which the water may flow from a considerable area.

In shooting a drilled well, the explosive



FIG. 1

should be placed at the maximum water-bearing area to secure the best effects. A quick, powerful explosive and a heavy charge should be used. Either solidified nitroglycerin or 60 per cent straight dynamite is the best, providing the column of water which may be standing in the well is not over 200 feet high. The exact size of the charge is governed by the depth of the well, the nature of the rock to be blasted and the proximity of buildings.

For a well 100 feet deep, an efficient and safe charge would be from 100 to 200 pounds of solidified nitroglycerin or from 150 to 300 pounds of 60 per cent straight dynamite. For each additional hundred feet, this loading could be increased by about 100 pounds.

The cartridges are packed in a cylindrical shell from 3 to 5 feet in length, made from tin or galvanized iron brought out to a point at the lower end, as shown in Figure 1, to prevent it from catching in its descent down the hole. If there is standing water in the hole, an opening should be made in the lower end of the shell so that the water may pass through and equalize the pressure on the explosives. When the shell is loaded, the bail is placed over a special hook, shown in Figure 2, on the end of a stout line, and the shell is slowly lowered down the hole. Then the hook is freed and drawn up.

In exploding the charge, either a jack-squib, as shown in Figure 3, or an electric squib, as shown in Figure 4, may be used.

The jack-squib consists of galvanized pipe about 2 inches in diameter and 36 inches in length, pointed at the lower end, which is filled as follows: Sand is poured into the pipe to a depth of about 6 inches, a cartridge of 60 per cent straight dynamite primed with two No. 8 blasting caps and two fuses is seated on the sand, and more sand is poured in until it fills the space around the cartridge and covers it to within 4 inches



FIG. 2

Protection for Municipal Property

¶ Forty years ago the Page organization originated the manufacture of woven wire fence, now used on thousands of farms throughout the country. The valuable experience in manufacturing and fabricating wire products thus gained has enabled the company to produce the Page-Protection (wire link) Fence, without equal today in its general excellence and durability. Every process of manufacture from the open-hearth furnace to the finished product is supervised by the Page Steel & Wire Company in its own mills.

¶ Page-Protection is necessary for lighting plants, pumping stations, storage yards, parks, watersheds, etc.

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Page-Protection Fence is also made of rust-resisting Arco Ingot Iron (99.84% pure).

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PAGE PROTECTION FENCE

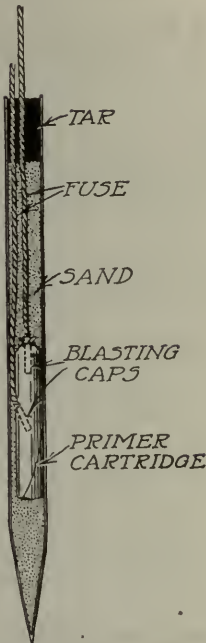


FIG. 3

from the top of the pipe. This remaining space is then filled with thick tar. As soon as the squire is prepared, both fuses are lighted, two being used in case one should fail. The squire is dropped into the hole, point down. The length of the fuse should be so calculated that it will explode about the time it strikes the charge and so detonate it.

The electric squire is similar in construction to the jack-squire, but shorter and larger in diameter, with a less sharply pointed end. It is usually about 5 inches in diameter and 20 inches long. It is filled to a depth of about 6 inches with sand, and then a priming charge consisting of one to two cartridges of 60 per cent straight dynamite is placed in the sand, one of the cartridges being previously primed with a No. 8 submarine electric blasting cap. To the wires of this cap, at a point which will come well within the squire shell, are spliced No. 14-gage copper wires long enough to reach to the bottom of the hole, and the splices are well taped. The remaining space is filled with sand topped with a layer of tar. This squire is carefully lowered by the wires until it rests upon the charge, and is then fired by means of an electric blasting machine.

If the well has struck water, there will probably be some standing water in the hole. Every foot of water in the hole exerts a pressure of 43.4 pounds per square inch. Consequently, a column of water 100 feet high over a charge of explosives exerts a pressure of 43.4 pounds on every square inch of the area of the charge. It is this pressure that makes it necessary to protect the detonator from moisture by placing it in the sand-filled and tar-sealed metal shell. As the pressure may tend to force out the

nitroglycerin from the cartridges, it is important to fire the shot as quickly as possible after loading. All preliminary precautions, such as removing objects within danger and notifying people, should be completed before the explosive is lowered into the hole, so that no time need be lost thereafter.

Most drilled wells contain a casing throughout a part or the whole of their depth. Exploding a heavy charge at the bottom of the well is likely to damage this casing, either blowing it out in fragments which may do harm if allowed to fly into the air, or causing it to collapse within the bore hole, or splitting it longitudinally along the seam. To prevent the casing from flying into the air, it is well to build a heavy grill-work over the mouth of the hole. This should be securely anchored to the ground. It is hardly possible to prevent splitting the casing, but this is not necessarily a serious result, for a casing that is merely split can easily be pulled out and replaced.

If the casing collapses, however, it is more difficult to remove. In a well 300 or 400 feet deep there is less likelihood that the casing will be blown out or split than in a shallower well, but there is danger of collapse whatever the depth of the well. To prevent the casing from collapsing, the hole should be either full of water to the top or empty of water for 50 feet below the bottom of the casing. This last would mean that the hole was cased through only a part of its length and the explosive charge seated at least 50 feet below the casing.

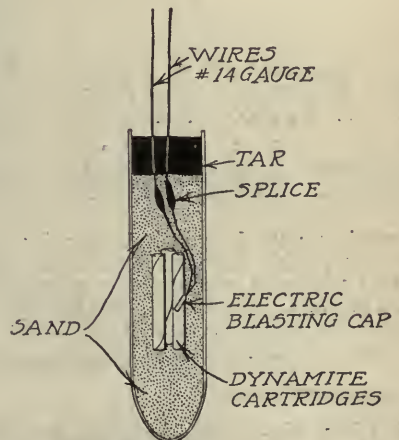


FIG. 4

Lots Sold For Cash On The Installment Plan

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DETROIT, MICH.
February 1st, 1922.

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Canton, Ohio.

Gentlemen: - Attention Mr. J. A. Fritobley

During the past five years I have used
many thousand feet of 12" to 70" Corrugated Metal
Culverts and have found that it has given excellent
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It is quickly and cheaply installed and
does not require the inspection that reinforced
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Having installed during the past seven years
over 75 miles of sewers, the sections of corrugated
culvert used are in an excellent state of preservation.

I prefer corrugated culverts from concrete
culverts on account of the speed, installation,
inspection and cost, as compared with reinforced
concrete culverts.

Yours very truly,
B. E. TAYLOR
Per *W.A. Magoon*
MGR. CONSTRUCTION DEPARTMENT

WAM:JP

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Riveted  **CULVERTS**

By using IMPERIAL Riveted Corrugated Culverts this real estate development company has made a big saving in drainage costs. Besides, work has been speeded up 25%. IMPERIALS are easy to handle and install. Made of Toncan Metal, they endure!

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The City's Legal Rights and Duties

Information for City Attorneys and Other Municipal Officers, Summarizing
Important Court Decisions and Legislation

Conducted by A. L. H. Street, Attorney at Law

Has a City the Right to Engage in the Sale of Foodstuffs?

THE decision of the Missouri Supreme Court in the case of *State ex rel. Kansas City v. Orear*, 210 Southwestern Reporter, 392, seems to be the latest reported decision of a court of last resort having a bearing on this subject; that case having been decided March 15, 1919. And the report of that case has the earmarks of referring to all previous precedents.

The view of the Missouri Supreme Court, which appears to be supported by the weight of judicial authority in other jurisdictions, may be thus summed up: A city may not engage in the sale of commodities unless authorized by its charter. And the legislature cannot confer charter authority unless the constitution of the state clearly permits it. Any exception to this rule must rest on a compelling necessity of the inhabitants of the city.

Holding that Kansas City was not empowered to establish a municipal ice plant, without modification of its charter and the Missouri constitution, the Court said, in part:

"Ice has but recently been elevated—granting for argument's sake the promotion—to a place among the necessities of life. . . . But be this as it may, it is yet certainly no greater a necessity to the human race than are food and clothing. If a city should undertake, absent compelling necessity at least, to establish and operate grocery stores and clothing 'emporiums,' no one would hesitate to say that no power exists in the municipality to use public money, or the proceeds of public taxation, for such purposes. Such things may be given away by the city to paupers and to the temporarily unfortunate, but the city cannot enter into the business of selling such articles to all inhabitants of such city who may desire to buy. If the cities, towns and villages of the state deem that their entry into private business in competition with individuals now engaged in such

business is a matter of public expediency, then the initial effort to this end must be an amendment to the constitution; and following such an amendment, the passage of an act changing the common law, which, even without the aid of the constitutional inhibition, forbids the levying and collecting of taxes for any private purpose or business. . . . If the situation were one of continuing or perennial necessity, a city might well have the power under the general welfare clause of its charter to take such steps as would be requisite to supply the compelling need for any such necessity of life so long as such condition existed."

We note that at the recently adjourned session of the Connecticut Legislature authority was enacted for the establishment of municipal ice plants; thereby indicating an understanding in that state that special charter authority is a prerequisite, as declared by the Missouri Court.

Previous court decisions bearing on the subject are reviewed in the opinion of the Missouri Court. It is noted that the Georgia Supreme Court upheld the right of a city to establish an ice plant (68 S. E. 472, 31 L. R. A. (N. S.) 116, 20 Ann. Cas. 199, 134 Ga. 560), but it was observed that the Georgia Court merely decided that such use of the public funds did not impinge upon the constitutional guaranty of "protection to person and property" and against deprivation of property without due process of law. It seems that the Georgia case was not considered, the Missouri Court holds, in the light of necessity for constitutional authority before public funds can be used in such enterprises. But it is conceded that in a later opinion the Georgia Court sustained the right of another municipality to establish an ice plant on the broad authority of the general welfare clause of its charter (147 Ga. 581, 94 S. E. 1022, Ann. Cas. 1918,



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907). On the other hand, it is noted that in an earlier case (101 Ga. 588, 29 S. E. 42) the same Court denied the right of the city of Waycross to engage in the plumbing business, as an incident to operating a water-works system.

Mention is made of the holding by the Maine Supreme Judicial Court that the Legislature might authorize municipalities to establish fuel-yards. (111 Me. 486, 90 Atl. 318, L. R. A. (N. S.) 1143, Ann. Cas. 1916C, 734.) But there is also citation to the Louisiana case where it was decided by the Supreme Court that the Legislature could not validly empower a city to establish an ice plant, in the face of a constitutional provision limiting the taxing power of municipalities to private purposes.

Other cited cases include the decision of the Ohio Supreme Court that the city of Toledo could not use public money to operate a moving picture show (88 Ohio St. 71, 102 N. E. 670, 48 L. R. A. (N. S.) 720, Ann. Cas. 1914D, 949), and the decision of the Virginia Supreme Court of Appeals that a city could not maintain a stone quarry without charter authority—not as a mere incident of keeping its streets in repair. (113 Va. 199, 73 S. E. 571, 38 L. R. A. (N. S.) 281.) Reference is also made to the following observations made by the Massachusetts Supreme Judicial Court on a question as to whether the Legislature might validly empower cities and towns to buy and sell fuel:

"Cities and towns now have ample power to provide in any reasonable way for paupers, whether it be by furnishing out-of-door relief, or by support in almshouses, and whether their need of relief is permanent or caused by a temporary condition. It is equally true that the second of these consequences does not justify taxation of those who do not have occasion to buy coal for the benefit of those who do. The use of the money of taxpayers for such a purpose would not be a public use, but a use for the special pecuniary benefit of those who happen to be affected by the state of the coal market." (182 Mass. 609, 66 N. E. 26, 60 L. R. A. 594.)

The Missouri Court also cites other cases bearing on the "discussion from the point of view that municipal corporations may not engage in private business, or use public money in business ventures heretofore deemed to be private." The decision was not unanimous, however, one of the judges—Mr. Justice Woodson—taking the posi-

tion that the police power of cities to provide for the public health of their inhabitants was sufficient to justify establishment of ice plants. Unfortunately, his opinion is deprived of considerable force through the circumstances that it cites no judicial precedent in support of itself.

An editorial note at pages 104, 105, Annotated Cases, 1918B, summarizes the conclusions of adjudicated cases as follows:

"First, it is beyond the power of a municipal corporation to engage in the sale of commodities which are and can be easily conducted by private business concerns in competition with one another, and which can be sufficiently regulated thereby."

"Second, the sale of fuel falls within the class of commodities mentioned, and there is no necessity why cities and towns should undertake this form of business any more than many others which have always been conducted by private enterprises."

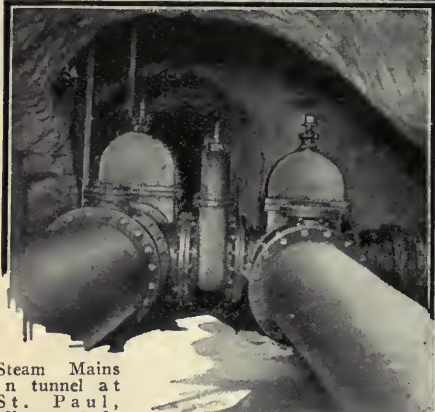
"Third, in regard to 'a condition in which the supply of fuel would be so small, and the difficulty of obtaining it so great, that persons desiring to purchase it would be unable to supply themselves through private enterprises, it is conceivable that agencies of government might be able to obtain fuel when citizens generally could not.' Under such circumstances, the municipality may constitute itself an agent for the relief of the community."

The Danger to the Privileged Party of a Cancellation Option in a Contract

That arbitrary power to determine a contract on short notice may affect its validity and prevent recovery for a breach of it, is shown by the opinion of the Georgia Supreme Court in the case of *City of Atlanta vs. National Surety Co.*, 106 *Southeastern Reporter*, 179.

Plaintiff city entered into an agreement with a coal company for a supply of fuel during a period of twelve months. Defendant became surety for performance of the agreement. Plaintiff sued for claimed breach on the part of the coal company, but the suit was successfully defended on the ground that there was no mutually binding contract. This defense was based on a clause in the agreement giving the city authorities power arbitrarily to terminate the contract on 48 hours' notice. Applying the fundamental rule of law that mutuality of obligation to carry out a contract is an essential to its validity, the Court says:

"If, independently of the part of the contract quoted, the city agreed to take the coal which the contractor by its bid offered to supply in re-



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sponse to the city's advertisement for bids, that portion of the contract just quoted left it entirely optional with the city to take or refuse to take the coal. A contract for the purchase of goods to be delivered in lots throughout a period of 12 months, which gives the purchaser the right at any time to serve notice upon the party contracting to deliver the goods to suspend deliveries, and stipulates that upon giving this notice to suspend deliveries the purchaser will be 'at liberty to refuse to accept' any further deliveries after 48 hours from the date of such written notice, is not a contract binding upon the purchaser. If the purchaser can at pleasure cancel an agreement to purchase, he has incurred no obligation; and to render a contract mutual, the obligation must be upon both parties."

City May Demolish or Remove Unlawfully Constructed Buildings

That municipal authorities may, on notice, lawfully and constitutionally demolish or remove wooden buildings erected in violation of the city's charter and ordinances within the fire limits of a city, is decided by the United States Supreme Court in the San Francisco case of *Maguire vs. Reardon*, 41 Supreme Court Reporter, 255.

Ordinance Providing for Removal of Limited Quantities of Ashes from Residential Buildings Held Not Unjustly Discriminatory

An ordinance adopted in Baltimore requires the street cleaning department to "remove all ashes from dwelling houses, apartment houses and tenement houses, not exceeding fifteen bushels per week from each, etc." The validity of this measure was disputed in the recent case of *Mayor and City Council of Baltimore v. Hampton Court Co.*, 113 Atlantic Reporter, 850. Upholding the ordinance as against objection that it was unjustly discriminatory against apartment houses producing more than fifteen bushels of ashes a week, the Maryland Court of Appeals says:

The argument in support of the charge of discrimination seems to be based on the theory that the removal of ashes by the city is undertaken as a matter of favor to householders, and on that theory it is contended that either all or none should be removed at public expense, because the work is paid for out of a common fund contributed by taxpayers, and therefore it is unjust to limit the number of bushels of ashes removed from a large apartment house, on which heavy taxes are paid, to that removed from a private dwelling, bearing a much lighter burden of taxation. It is also argued that if 60 families elect to live in one house large enough to accommodate them, it is unreasona-

ble to deny them the right to have all their ashes removed at public expense, while their neighbors who do not live in apartment houses, or in houses large enough to produce more than fifteen bushels of ashes, are relieved of the expense and trouble of providing for the removal of any part of such refuse.

"The answer to both these arguments is that the partial removal of ashes by the city, as provided for in this ordinance, is not undertaken primarily as a matter of favor to individuals or to serve their convenience. If it were, the man who used gas or electricity instead of coal or wood might justly complain that he was being taxed to help pay for services rendered by the city to his neighbor who used ash-producing fuel; and the family living at a hotel might insist that it was being discriminated against.

"As a practical proposition, however, the total amount paid annually by the appellees for the removal of ashes, as shown by the record, is too small when considered in relation to the number of families occupying the apartment to be reflected in the rents paid by the tenants, and it is not believed they are substantially interested in the controversy.

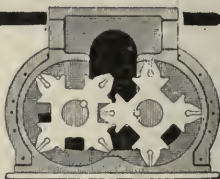
"The only justification for the use of public money at all in an enterprise of this sort is that it serves a public purpose. It is necessary that ashes be removed from time to time to protect the public from the nuisance which their accumulation would occasion, not to the householders as such, but to the public generally using the streets of the city. How this shall be done is for the municipal authorities, and not for the courts, to determine.

"It does not seem to be any more reasonable to require owners of large apartment houses to provide for the removal of their ashes in excess of the amount produced by the owner of large dwellings, than to require hotels, factories and department stores producing large quantities, to remove the same, as we said in *Mayor and City Council of Baltimore v. Hampton Court Co. et al.*, supra, they could be compelled to do."

Requiring Removal of Street Car Tracks on Franchise Expiration

The United States Supreme Court has reaffirmed the rule of law that "where a street railway company, operating in the streets of the city under a franchise granted for a definite period, has enjoyed the full term of the grant, the municipality may, upon failure of renewal of the grant, require the company within a reasonable time to remove its tracks and other property from the streets, without impairing any contractual obligations protected by the Federal Constitution or depriving the street railway company of its property without due process of law." *Detroit United Railway vs. City of Detroit*, 41 Supreme Court Reporter, 285.)

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EPIDEMIOLOGY AND PUBLIC HEALTH—A TEXT AND REFERENCE BOOK FOR PHYSICIANS, MEDICAL STUDENTS AND HEALTH WORKERS. VOLUME I, RESPIRATORY INFECTIONS

By Victor C. Vaughan, M.D., Emeritus Professor of Hygiene, University of Michigan; Henry F. Vaughan, Dr.P.H., Commissioner of Health, Detroit; and George T. Palmer, Dr.P.H., Epidemiologist, Department of Health, Detroit, Mich. C. V. Mosby Company, St. Louis, Mo. 1922. 688 pp. Diagrams and tables. \$9.

This is the first of a series of volumes on epidemiology which will undoubtedly be the standard works of this nature for years to come. This first volume covers the entire field of respiratory infections and is based on the broad experience of the author and his collaborators. Professor Victor C. Vaughan says, "In my opinion, the present-day medical man, including the epidemiologist, is not as fully conversant as he should be with the history of epidemic diseases." A complete knowledge of epidemiology is a prime requisite of the health officer and his departmental assistants, particularly in times when terrible epidemics or pandemics are taking the lives of many valuable citizens. This three-volume work should be a guide to health officers in fighting future epidemics. The second and third volumes cover the following subjects: Volume II, Alimentary Infections, Percutaneous Infections, Venereal Infections, Local Infections; Volume III, Public Health, State Medicine, etc.

A HISTORY OF SOCIAL THOUGHT

Emory S. Bogardus, Ph.D., Head of the Department of Sociology and Social Work, University of Southern California. University of Southern California Press, Los Angeles, Calif. 1922. 510 pp. \$3.50 postpaid.

This is a history of all the schools of social thought, from the earliest times, with sketches of the ideas of the classic period, of the middle ages, the ideas of Malthus, Comte and Marx. Such chapters as those on eugenics and psycho-sociology and the sociology of modern Christianity bring the subject down to the present.

EVERYDAY CIVICS

Charles Edgar Finch, Director of Junior High School Grades and Citizenship, Rochester, N. Y. American Book Company, New York. 1921. VIII + 326 pp. Illustrated. \$1.20.

A text-book for elementary schools, for use either alone or as a supplement to a course in American history. The various features of city, state and Federal Government are simply and clearly presented in a way easily grasped by students.

STANDARDS FOR AMERICAN CITIES

"Attainable Standards in Municipal Programs." Prepared by Howard W. Odum, Ph.D., Professor of Sociology, University of North Carolina. Published as University of North Carolina Extension Bulletin, Vol. I, No. 7. 1921. 130 pp. Illustrated. 60 cents. A partial report of the First Regional Conference of Town and County Administration, held at Chapel Hill, N. C., September, 1921. (Apply to University Extension Division, University of North Carolina, Chapel Hill, N. C.)

ESTABLISHMENT AND REGULATION OF OPEN AIR MARKETS

"Suggestions for an Ordinance to Establish, Locate, Regulate and Maintain a Public Farmers' Market and for Other Purposes." Published as Service and Regulatory Announcements (Markets) No. 69, Bureau of Markets and Crop Estimates. 14 pp. 1921. (Apply to Bureau of Markets and Crop Estimates, United States Department of Agriculture, Washington, D. C.)

ZONING IN AKRON, O.

"The Tentative Zoning Plan for Akron." Published by the City Planning Commission, Akron, O. October, 1921. Maps and illustrations. This report explains the purpose of zoning in general and the tentative plans for Akron in particular. (Apply to E. A. Zelsloft, Chief Engineer and Secretary, City Planning Commission, Akron, O.)

TOWN THEORY AND PRACTICE

Edited by C. B. Purdom, author of "The Garden City." Benn Brothers, Ltd., 8 Bouverie Street, London, W. C. 4. 1921. 139 pp. Illustrated. 5 shillings.

This volume is a compilation of papers on various phases of the town planning and garden city movement. Its contributors are W. R. Lethaby, late Professor of Design, Royal College of Art; G. L. Pepler, Past President, Town Planning Institute; Sir Theodore Chambers, Chairman, Welwyn Garden City; R. L. Reiss, Chairman Executive Committee, Garden Cities and Town Planning Association; and Raymond Unwin, author of "Town Planning in Practice."

THE FEDERAL SERVICE

Lewis Mayers, Ph.D., Member of Staff, Institute for Government Research, New York. D. Appleton and Company, New York. 1922. XV + 607 pp. \$5.

This is one of the publications of the Institute for Government Research, and is a study of the system of personnel administration of the United States Government. It includes a study of the elimination of politics from the civil service, the problems of selection and recruitment, classification, maintenance of efficiency, working conditions, and the organization of Personnel Administration. Many of the conclusions drawn from this study of the Federal Government are of practical application to the problems of municipalities.

AN UNUSUAL MUNICIPAL REPORT

"Detroit's Government, A Short Story of the Services Rendered During the Year 1921, to the People of the City of Detroit by their City Government." Published by the Council and Mayor of Detroit, February, 1922. 77 pp. The facts usually given in a municipal report presented in an interesting and readable manner. Edited by Henry Steffens, Jr., City Comptroller. Apply to the Detroit Bureau of Governmental Research, Inc., 100 Griswold Street, Detroit, Mich.)

CITY PLANNING IN WATERTOWN, MASS.

"Report on the Proposed Location for Town Hall, Together with Other Changes Suggested in Watertown Square." Prepared for the Planning Board of Watertown, Mass., by John Nolen and Philip W. Foster of Cambridge, Mass. 1921. 14 pp. Map. (Apply to John Nolen, Harvard Square, Cambridge, Mass.)

GAS MASKS FOR FIRE FIGHTING

"Gas Masks for Gases Met in Fire Fighting," by Arno C. Fieldner, Sidney H. Katz and Selwyn P. Kinney. Published by the Bureau of Mines, Department of the Interior, as Technical Paper 248. 1921. 61 pp. Illustrated. 25 cents. This pamphlet includes discussions of the types of gases likely to be encountered by firemen, and the types of masks and breathing apparatus in use. (Apply to the Superintendent of Documents, Government Printing Office, Washington, D. C.)

IOWA STATE FIRE MARSHAL'S REPORT

Eleventh Annual Report of the Iowa State Fire Marshal for the year 1921. (Apply to J. A. Tracy, State Fire Marshal, Des Moines, Ia.)

CHILD HEALTH IN NEW YORK CITY

"Infant Mortality in New York City, by Ernst Christopher Meyer, Ph. D., Director of Surveys and Exhibits, The Rockefeller Foundation, International Health Board, New York City. 1921. 135 pp. Charts. A study of the results accomplished by infant-life-saving agencies, 1855-1920. (Apply to author, at the Rockefeller Foundation, 61 Broadway, New York, N. Y.)

SOUND-PROOF CONSTRUCTION

"Sound-Proof Partitions," by F. R. Watson, Professor of Experimental Physics, University of Illinois. Published as Bulletin No. 127, Engineering Experiment Station, University of Illinois, Urbana, Ill. 1922. 85 pp. Illustrated. 45 cents. An investigation of the acoustic properties of various building materials, with practical application. (Apply to publishers, address above.)

THE AMERICAN CITY

GOODYEAR YEAR



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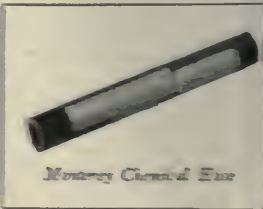
In many ways Goodyear Cord Tires assist economy in truck operation. Their buoyant cushioning lowers maintenance costs, just as their rugged strength saves tire renewals over unusually long periods. The tough, sharp-edged blocks of the All-Weather Tread insure dependable traction at all times. The unusually strong

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Monterey Chemical Hose

WATER SUPPLIES FOR WARREN, O.

Report on the Development of the Water Resources of the Mahoning River, Including Stream Control for Sanitary Purposes and for Water Supply," prepared for the Mayor and City Council of the City of Warren, O., by Alexander Francis, Consulting Engineer, of New York 1921. 146 pp. Maps. (Apply to author, 30 Church Street, New York, N. Y.)

HEALTH DEPARTMENTS OF AMERICAN CITIES

First Report of the Committee on Municipal Health Department Practice of the American Public Health Association. Prepared from the American Journal of Public Health, January and February 1922. 19 pp. 2 cents. This report was presented at the Fifteenth Annual Meeting of the Association, November, 1921. (Apply to Dr. Louis I. Dublin, American Public Health Association, 770 Seventh Avenue, New York, N. Y.)

RURAL SOCIOLOGY

"Rural Primary Groups," by J. H. Eells, of the Department of Agricultural Economics of the Agricultural Experiment Station, University of Wisconsin, Madison. Was published as Research Bulletin 51, 1921. 82 pp. Maps. This is a study of rural groups which have developed or which are potential units. It was carried on cooperatively by the Agricultural Experiment Station of the University of Wisconsin and the Division of Farm Life Studies of the Office of Farm Management and Farm Economics of the United States Department of Agriculture. (Apply to Rural Life Station, Department of Agricultural Economics, University of Wisconsin, Madison, Wis.)

THE BACILLUS WELCHII

"Bacillus Welchii in a Public Water Supply as a Possible Cause of Intestinal Disease," by Herbert B. Lueder, S. B. Health Officer, Muskegon, N. J. Reported from The Journal of the American Medical Association, January 28, 1922. 8 pp. (Apply to American Medical Association, 535 North Dearborn Street, Chicago, Ill., or to author.)

CIVIL SERVICE IN ST. PAUL, MINN.

"The Merit System in Saint Paul." The eighth annual report of the Bureau of Civil Service, St. Paul, Minn., for the year 1921. 45 pp. and charts. (Apply to Jesse Furr, Comptroller.)

THE WORK OF THE FOREST PRODUCTS LABORATORY

"The Forest Products Laboratory—A Decennial Record, 1913-1922." Published by the Decennial Committee, Edward F. Weiss, Chairman, 1921. 146 pp. Illustrated. An account of the work done in the institution of industrial research maintained by the Branch of Research, Forest Service, United States Department of Agriculture, at the University of Wisconsin, Madison, Wis. (Apply to Carlisle P. Winchell, Director, Forest Products Laboratory, Madison, Wis.)

LEGAL AID IN NEW YORK CITY

Fortieth Annual Report of the President, Treasurer, and Attorney of The Legal Aid Society," for the year 1921. 46 pp. (Apply to Leonard Noble, Attorney-at-Law, The Legal Aid Society, 289 Broadway, New York, N. Y.)

WEIGHTS AND MEASURES

Report of the Fortieth Annual Conference on Weights and Measures, held at the Bureau of Standards, Department of Commerce, Washington, D. C., May 1921. Miscellaneous Publication No. 45, 1922. 222 pp. 20 cents. Verbatim report of the conference. Includes text of model standard-head bread law. (Apply to Bureau of Standards, Department of Commerce, Washington, D. C.)

TRACTION PLANS FOR CHICAGO

Opinion and Report submitted to the Sub-Committee on the Formulation of Traction Plans," by William H. Sexton, Stephen A. Foster and Jerome N. Frank. Council of the Committee on Local Transportation, Chicago, 1922. (Apply to Clarence S. Schwartz, Chairman of the Committee on Local Transportation, Chicago, Ill.)

ATLANTA CONVENTION OF FIRE CHIEFS

Proceedings of the Forty-ninth Annual Convention of the International Association of Fire Engineers, Atlanta, Ga., October 1921. 270 pp. Illustrated. (Apply to the Secretary, James J. Mulcahy, Chief, Fire Department, Trunkers, N. Y.)

BOXING IN SAN FRANCISCO

Building Zone Ordinance of the City and County of San Francisco, approved October 3, 1921. 3 pp. and numerous maps. (Apply to J. S. Dunningan, City Clerk, San Francisco, Calif.)

THE SERVICE CITIZENS OF DELAWARE

"How the Service Citizens Serve the Citizens of Delaware." Report made to the Board of Managers of the Service Citizens of Delaware, November 18, 1921, by Joseph H. Odell, Director. 26 pp. (Apply to Joseph H. Odell, Director, Service Citizens of Delaware, Public Library, Wilmington, Del.)

BENCH MARKS IN NEW JERSEY

"A List of Bench Marks in New Jersey," revised in 1920, by Loren P. Flummer, Jr. Published as Bulletin No. 21, Geologic Series, of the Reports of the Department of Conservation and Development, Division of Geology and Waters. 116 pp. and map. (Apply to Alfred Gaskill, Director, Board of Conservation and Development, Trenton, N. J.)

A SURVEY OF DUBOIS, PA.

"Know Your Own City," by the Civics Classes of the Dubois, Pa., High School, 1920-21, J. B. Lambert, Instructor. 20 pp. 1921. A survey of the resources and advantages of the city. (Apply to J. B. Lambert, Dubois High School, Dubois, Pa.)

THE FOREST PRESERVES OF COOK COUNTY, ILL.

"The Forest Preserves of Cook County, Ill." Report for the year 1921. 253 pp. Illustrated. (Apply to Board of County Commissioners, Cook County, Chicago, Ill.)

FORESTY IN OREGON

Eleventh Annual Report of the State Forester, for the year ending December 31, 1921. 29 pp. (Apply to F. A. Elliott, State Forester, Salem, Ore.)

CITY PLANNING IN MEMPHIS, TENN.

Fifth Annual Report, City Planning Commission, Memphis, Tenn. 1921. 42 pp. Maps and illustrations. The report embodies the work accomplished by Memphis during its first year of city planning, under the counsel of Harold Bartholomew. (Apply to C. C. Paschky, Secretary, City Planning Commission.)

PROTESTS AGAINST TAX INCREASES

Two pamphlets published by the Chicago Bureau of Public Efficiency, 315 Plymouth Court, Chicago, Ill.: "A Protest Against the Proposed New County Road Tax." April 1, 1922. 8 pp.: "Suggestions for Avoiding an Unnecessary Increase in School Taxes." April 4, 1922. 6 pp. Both in letter form, the first addressed to the Board of Commissioners of Cook County, the second to the Board of Education of the City of Chicago. (Apply to Morris S. Keeler, Director, Chicago Bureau of Public Efficiency.)

MOSQUITO EXTERMINATION

"Mosquitoes and Mosquito Control." By George W. Simons, Jr., S. B., Chief Sanitary Engineer, Florida State Board of Health, and George P. Moulton, Entomologist, Bureau of Entomology, U. S. Department of Agriculture. Published by the Florida State Board of Health, Jacksonville, Fla. 1922. 36 pp. Illustrated. Describing the appearance and habits of the mosquitoes of Florida which cause dengue fever, yellow fever and malaria, and giving their life history. Explaining in detail effective control measures and showing what every community ought to do to be free from the effect of these pests upon health and prosperity. (Apply to George W. Simons, Jr., Chief Sanitary Engineer, State Board of Health, Jacksonville, Fla.)

BUILDING REGULATIONS

"Limitation of Heights of Buildings," prepared by the City Planning Commission of Akron, O. 1922. 16 pp. Giving the reasons for the Commission's recommendation of the 120-foot limit. (Apply to E. A. Trisland, Secretary, City Planning Commission, Akron, O.)

REGIONAL PLANNING

Proceedings of the First Regional Planning Conference of Los Angeles County, California. Held at Pasadena, January 21, 1922. 24 pp. Maps and illustrations. (Apply to E. Gordon Whitwell, Secretary of the Executive Committee, City Hall, Los Angeles, Calif.)

Officers Baker, Ryan and Smith, with their Harley-Davidsons, "keep law and order" at a profit for Sacramento County, Cal.



Two New Records Set by Sacramento County Traffic Squad

In 12 months, Sacramento County, California, received \$9,508.50 in fines resulting from arrests made by the three Harley-Davidson-mounted officers of the County Traffic Squad. And Officer Tom Ryan (shown in the center) rode his 1921 Harley-Davidson 21,000 miles at a cost for repairs and tires of only \$12.40 per month.

No wonder over 800 cities and counties are using Harley-Davidsons for police work! No extra cost for the taxpayers. Fewer crooks in the vicinity. Less speeding and reckless driving. Increased revenue for the police department. And with all, the most mobile, "ready-for-any-emergency" kind of police protection a community can have—protection which citizens and business houses appreciate.

Ask your local dealer for free demonstration of the 1922 Harley-Davidson. The reduced prices will surprise you, too.

HARLEY-DAVIDSON MOTOR COMPANY
MILWAUKEE WISCONSIN



CITY officials and those interested in police department efficiency should have our new book, "Motorcycles for Police and Sundry Purposes." Write on your letterhead for your complimentary copy, and see how other cities are using motorcycles to increase police efficiency.

Harley-Davidson

World's Champion Motorcycle

Methods, Materials and Appliances

News for City and County Engineers, City Managers, Water-Works Superintendents, City Controllers, Park Superintendents, Purchasing Agents, and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

Road Graders and Rollers

Owing to the demand for smaller size machines than the regulation one-man "Road-Razer" made by the Avery Company, Peoria, Ill., this company has brought out a small size machine for narrow roads and streets. The width of the original Road Razer from drive wheel to drive wheel is 93 inches. It has a three-section blade 12 feet 6 inches long and cuts a 9-foot 6-inch swath. The new model Road Razer is 70 inches wide, has a three-section blade 10 feet 3 inches long, and cuts a 7-foot swath.

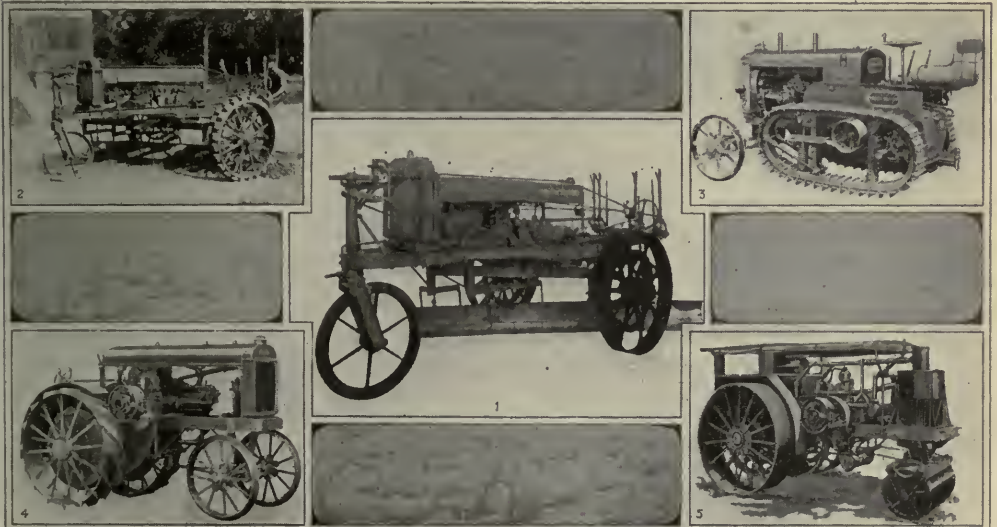
For service on gravel, crushed stone, and oiled streets and roads, the regulation machine has been equipped with rubber block tired wheels. This equipment has been used quite successfully in Indiana, Ohio and Michigan, where there are a great many gravel and crushed stone roads. F. E. Burt, Superintendent of Streets of Flint, Mich., reports that with the rubber-tired equipment he has found the machine much more satisfactory for city work, where at times it is necessary to drive over asphalt paving to get to a job; the rubber-tired wheels make it possible

to do this without cutting the pavement with the lugs.

The Avery Company has also brought out recently a Track-Runner tractor which has considerable value in the city and county fields. There is one track-runner on each side, each about 6 feet over-all. The tractor weighs about 5,000 pounds complete and can turn practically in its own length.

In addition to the track-runner machine mentioned above, there is a new 12-20 Avery tractor with direct wheel drive and spur gear transmission. The horse-power draw-bar rating is 12 and 20 on the belt. It is run by a 4-cylinder engine with $4\frac{1}{2}$ -inch bore and 6-inch stroke operating normally at 800-950 r.p.m. The engine, complete with all equipment, weighs 1,250 pounds. The driving wheels of the built-up type are 52 inches in diameter, with 14-inch face. The turning radius of the machine is 9 feet.

Avery road tractors may be furnished with a road roller attachment, which hooks under the front end of the tractor in place of the front wheel. It is entirely different from any other type of road roller which this company has



VARIOUS ADAPTATIONS OF A TRACTOR UNIT

1. A small-size "Road Razer" for narrow roads and streets. 2. A regulation-size machine equipped with rubber block tired wheels for running over gravel and other similar roads. 3. A track-runner tractor that insures good traction. 4. A tractor with direct wheel drive. 5. An Avery road tractor with road-roller attachment

Good roads all year 'round



Through the simple addition of Water Tank, Pressure Pump, Spraying Attachment and lighter broom, the FOX ROTARY SNOW BROOM has been successfully converted into a Street Sweeper that will clean perfectly at the rate of 12 miles per hour.

The possession of this machine assures to Municipalities the certainty of clean streets in both winter and summer.

Get detailed information from us and reports from Cities now operating this remarkable machine all year 'round.

Fox Rotary Snow Broom Co.

Two Lombardy Street, Newark, N. J.

used and makes it quite easy for road officials to roll the roads with the same machine which they use in building them. It has the same wheel base as the Avery tractor with the front wheel. The tractor will turn around as short with the roller as with the axle. The turntable is mounted on ball bearings, having 75 one-inch hard steel balls which carry the roller. This machine makes it possible for road builders to roll and pack a road as they grade it. The tractor with the roller is 9 feet wide and has an average pressure of 175 pounds to the square inch. This road roller attachment can easily be removed in less than an hour and the wheels put back on the machine for use in hauling and other road jobs.

Well Screens to Protect Pumps

Well screens of two types—all-brass, and pipe base—are manufactured by Edward E. Johnson, Inc., St. Paul, Minn., for use in connection with driven wells ending in sand or gravel, to prevent the entrance of sand into the pumping system.

The all-brass screen is a cylinder made up of the coils of a single strip of brass of special section, the successive coils of which interlock. The brass strip is so shaped that a narrow slit occurs on the outer face of the cylinder between

successive coils. The water passes through the slit into an interior annular space, the sides of which diverge sharply from the slit to prevent clogging. The inside or supporting wall is reinforced by brass rods soldered continuously to the inside wall. The screens are made in sections from 2 to 18 feet in length, for setting in pipe from 2 to 16 inches in diameter, and with inlet slots .006 to .06 inch in width. They are adapted for setting in wells by pulling back the casing, washing down or bailing, but not for driving.

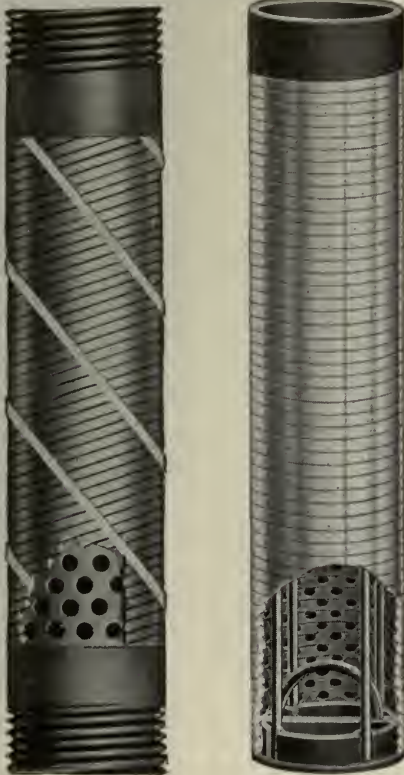
The pipe base well screen is designed particularly for conditions which require the driving of the screen ahead of the casing. It consists of an iron pipe, perforated and threaded, the perforated section being covered with a continuous spiral wrapping of Johnson's jacket ribbon soldered to the pipe and having upon it in open spiral a tinned solder strip wound in the opposite direction for reinforcing. The jacket ribbon is made up of parallel strands of triangular brass wire soldered crosswise at regular intervals to maintain the slot openings. These screens are made in sizes to fit in wells from 2 to 18 inches in diameter. The screen can be removed, cleaned and replaced, or a new screen surface applied at the well.

Lighting the Ideal Section of the Lincoln Highway

The necessity for lighting main highways in the open country so impressed the Technical Committee of Highway Engineers and other experts who determined the specifications for the Ideal Section of the Lincoln Highway Association that the problem of ideal illumination was given to the illuminating engineers of the General Electric Company, Schenectady, N. Y., headed by W. D'Arcy Ryan, for solution.

The most advanced type of highway lighting unit that this company has developed will be installed on the Ideal Section this summer. It is simple in design and economical in regard to installation cost and operation as well as maintenance. It embodies a new principle for collecting the light rays and casting them on the roadway instead of on the vacant fields adjacent to the highways. This is accomplished by a nest of reflectors, a series of three, one within another. These reflectors serve to collect the light which would be reflected upward and outward over the adjoining field and to cast it on the surface of the road, at the same time preventing the possibility of glare, the danger and annoyance of which are realized by the motorist. The bracket holding the lamp and the nested reflectors is to be affixed to an ornamental concrete pole 35 feet high. The bracket is adjustable in both horizontal and vertical positions, permitting the illumination of hill-sides and curves in the road.

One of these units will be installed every 250 feet along the edge of the paving, alternate lighting standards being on opposite sides of the road. All power wires for lighting will be underground, and the lights will be controlled by an automatic oil time switch, which can be ad-



BRASS WELL
SCREEN

BRASS PIPE
BASE WELL
SCREEN



Tractors for power, speed, economy

Preparing streets for repaving, breaking up old pavements, making new thoroughfares, all require an abundance of steady, dependable power.

Scarifiers, plows, drills, levelers, scrapers, graders, etc., do their best work, and more of it, when propelled by good tractors. This is because the tractor has the reserve power to keep the tool moving constantly at proper speeds and with proper adjustments for maximum results.

Tractors like the BEST concentrate the pulling power of a large number of animals within a small unit which is easy to manage, easy to maneuver, and which has none of the weaknesses of the flesh.

Best Tractors are famous for stamina, power and dependability, and their cost for up-keep and operation is small. That is why they are being adopted more and more by municipal, county and state officials for road and street making and maintenance.

Let us send you further details on the use of tractors for road and street work. Write for catalogs, prices and names of our nearest dealers.

C. L. BEST TRACTOR CO.
SAN LEANDRO - CALIFORNIA

There are three models of Best Tractors—the "Sixty," the "Thirty" and the "Cruiser" (60). All are factory-built—not assembled.



"Sixty"



"Thirty"



"Cruiser"



LIGHTING A ROAD WITHOUT LIGHTING THE FIELDS

justed to turn them on and off at any determined hour in the evening and the morning.

The cost per unit per year is figured at \$23.50, and as there are twenty lighting standards with their units per mile, the cost of lighting the roadway per mile for the necessary hours each night will be only \$465, including maintenance and current. This figures to about 25 cents per foot of roadway per year, which is low considering the benefits to be derived, including accident prevention, increased night traffic, thereby relieving day congestion, decreased running time, increased road capacity, additional comfort and pleasure for those driving at night, through relief of eye-strain and the elimination of the necessity of switching dimmers on and off when passing other vehicles.

The subsidiary benefits of rural highway lighting must be considered also. Power lines required for rural illumination bring electricity to the farm, increase real estate values, tend to

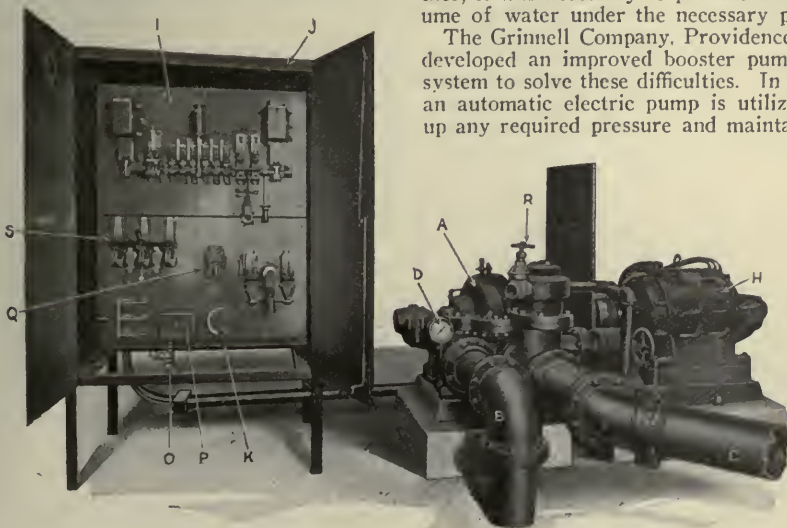
the extension of city building out along the roadways, and discourage automobile hold-ups.

Fire Sprinkler Systems for Low Water Pressure Cities

Low city water pressure has been one of the greatest drawbacks to the more general use of automatic sprinkler systems. Especially has this been so in the greatest congested value districts in the world. In New York, Chicago, Philadelphia and Detroit, city water pressure is inadequate to supply sprinkler system in even moderately high buildings. In cities and towns having low water pressure, there are millions of dollars' worth of combustible business values which have been denied the many benefits of sprinkler protection because of inadequate city water pressure, for two reasons: the impossibility of introducing low-cost single-source sprinkler systems supplied only by city water; and the impracticability of tank-supplied systems, on account of high first cost, due to the expense of tanks and building alterations, and on account of structural weaknesses in the buildings themselves, rendering them incapable of supporting tanks even after extensive alterations.

These factors have combined to make it exceedingly difficult to eliminate frequently recurring individual fires and the danger of sweeping conflagrations in many great congested value districts. The solution of this problem demanded the creation of high water pressure without the use of tanks, and the assurance that whatever pressure was created would be at least as certain as the average city water pressure. Further, it was necessary to provide unlimited volume of water under the necessary pressure.

The Grinnell Company, Providence, R. I., has developed an improved booster pump sprinkler system to solve these difficulties. In this system an automatic electric pump is utilized to build up any required pressure and maintain it. The



AN AUTOMATIC ELECTRICALLY-DRIVEN BOOSTER FIRE PUMP

A. The pump. B. Low-pressure supply pipe. C. High-pressure discharge line. D. Supply-pressure gage. H. Electric motor. I. Combined manual and automatic starter panel. J. Cabinet for starter panel. K. Automatic regulator for pump. O. Test valve. P. Pipe from test valve wasting to sewer. Q. Relay on control board for closing test valve. R. Valves for attaching hose. S. Circuit breakers



TRINIDAD In the Nation's Capito'
12th Street, N. W., N to O Streets, Washington, D. C.,
Laid with Trinidad Lake Asphalt in 1881.

Forty-one years of life under traffic in Washington

Laid in 1881—before the “gasoline buggy” was even heard of—when the women of Washington wore bustles—and good for many years to come!

That's the remarkable history of the Trinidad paving on 12th St., N. W., N to O Sts., Washington, D. C.—one of the capitol's many splendid Trinidad streets. For the past years the maintenance cost on this street has been only .0177 cents per square yard per year.

And it's just such unbeatable records—established under the most severe conditions of traffic and weather—that have made Trinidad Lake Asphalt “The Standard Paving Material of the World.”

Trinidad Lake Asphalt is a product of the Ages. Centuries of exposure to the rigors of tropic weather have but seasoned and toughened it for long-lasting service on modern highways.

Before repaving that old street or paving a new, let us tell you more about this wonderful material. Write for illustrated folders.



The Genasco Line includes asphaltic roofing, flooring, paints and allied protective products. Write for descriptive matter.

New York
Chicago
Pittsburgh

THE BARBER ASPHALT
COMPANY
PHILADELPHIA

St. Louis
Kansas City
Atlanta
San Francisco

TRINIDAD LAKE ASPHALT

idea of a booster pump is not new, but certain features have been developed distinguishing this pump from the ordinary automatic equipment.

In its elements the new system is practically the same as any single-source sprinkler system supplied by city water, except that the whole pump unit is cut into the system between the city connection and the main riser. The capacity of the pump is determined by the size, construction and contents hazard of the building to be protected. The pump takes suction direct from the city water-mains and builds up the pressure in the sprinkler system to the required amount. It then stops working, but whenever the built-up pressure falls appreciably, the pump automatically starts and works until the full pressure is restored. In the case of fire with a consequent opening of sprinkler heads and reduction of pressure, the pump continues to operate and maintain adequate pressure on the sprinklers up to its full capacity.

Tractors in Road Building

The tractor is fast taking the place of animal power in road building and road maintenance work. It has proved a big time-saver, not to mention the fact that a tractor can be operated continuously without a rest, with less help, and over ground conditions impossible to negotiate with animal power.

The special advantages claimed for the Best Tracklayer tractor, made by the C. L. Best Tractor Company, San Leandro, Calif., are that it has dependable flexible power, giving the road building contractor, the highway engineer and the supervisor the assurance that the tractor will handle the job at hand without trouble. These tractors are built for heavy-duty service, which necessitates the use of good materials. They are built compactly, are easy to handle and have sufficient reserve power to respond to unusual demands. In the handling of elevating graders, scarifiers, levellers, graders, plows,



BUILDING ROADS IN NORTH CAROLINA

chisels and other implements used for road construction and maintenance, these tractors have made many good records. One illustration shown herewith gives a good idea of their use in hauling a long line of wide-wheeled trailers loaded with gravel for a highway job. The other depicts one of these machines hauling a blade grader on a road job in North Carolina, easily piling up the dirt from the ditch onto the crown of the road.

A Self-propelled Tree Sprayer

With spring here, city foresters and entomologists are turning to getting spring spraying done on all trees that are threatened with moths and other parasites. The Field Force Pump Company, Elmira, N. Y., manufacturer of the "Ospraymo" line of spraying equipment, makes a self-propelled machine of high power with auto truck drive, for municipal departments. This machine is also used by the Bureau of Entomology, U. S. Department of Agriculture.

The complete tank and pumps are mounted on a 3½-ton truck. The engine has ample power to drive the truck and operates the pump at 600 pounds working pressure. It is equipped with a roller-chain drive direct from the main line shaft of the truck engine to the pump. The pump drive is equipped with a jaw clutch controlled from the driver's seat and is of the triplex plunger type, having cylinders of 3½-inch bore and 4-inch stroke, with 50 gallons per minute capacity at 600 pounds pressure. The tank holds 400 gallons, is made of clear white pine or cypress, and is fastened to the frame by four steel rods passing through the sills and upward through the top ledge of the tank, which has a filling hole of ample size with hinged cover. The pump and gearing are protected by oiled duck side-curtains, forming a tight housing.

The contents of the tank are thoroughly mixed by an agitator driven directly from the pump by a chain belt. The steel shaft and long



HAULING GRAVEL TO HIGHWAY JOB

WHY TIFFIN FLUSHERS

Superb Construction, Superior Design,
Specialized Quality Units, Unity of Service

ECONOMY, EFFICIENCY, DURABILITY, SANITATION

Ask users about Tiffin Flushers and Tiffin Service.

Write us for catalog and engineering detail.

THE TIFFIN WAGON COMPANY, TIFFIN, OHIO

"THE BEST BY EVERY TEST"

**72 New Contracts for 1,478,333 Square Yards of
Warrenite-Bitulithic Pavement Since January 1**

Because

Warrenite-Bitulithic can be laid over any suitable existing base and will give dependable service for longer periods than other types of paving.

Because

Warrenite-Bitulithic has always given the most satisfactory kind of service under the severest use and the hardest climatic conditions.

Because

Warrenite-Bitulithic has been adopted as a standard construction in over 550 cities throughout the United States and Canada.

Our expert supervision and laboratory service insures quality and service without equal.

Let us send you our booklet about Warrenite-Bitulithic.

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Memphis, Tenn.
Los Angeles, Cal.

Washington, D. C.
Minneapolis, Minn.
San Francisco, Cal.



A HIGH-PRESSURE SPRAYER FOR PROTECTING TREES FROM THE RAVAGES OF MOTHS AND OTHER INSECTS

paddles extend the entire length of the tank. The poison-mixing tank is of galvanized iron 16 inches in diameter by 18 inches deep, mounted between the pump and the liquid tank and having the mixing paddles driven from the agitator shaft, so that the mixing is thorough and continuous. Two hydraulic pressure gages, registering 1,000 pounds, and two safety release valves are included, so that the liquid may flow back into the large solution tank when the nozzles on delivery lines are closed. Running boards are placed on both sides of the machine, and a stout railing of gas pipe on top of the tank affords protection and safety for the crew.

These machines are built from specifications furnished by the United States Department of Agriculture and are carefully built and worked out for spraying large, tall trees in forests or parks for protection from the gypsy moth, elm leaf beetle, tussock moth and other pests of woods and farms.

Municipal Development Engineer

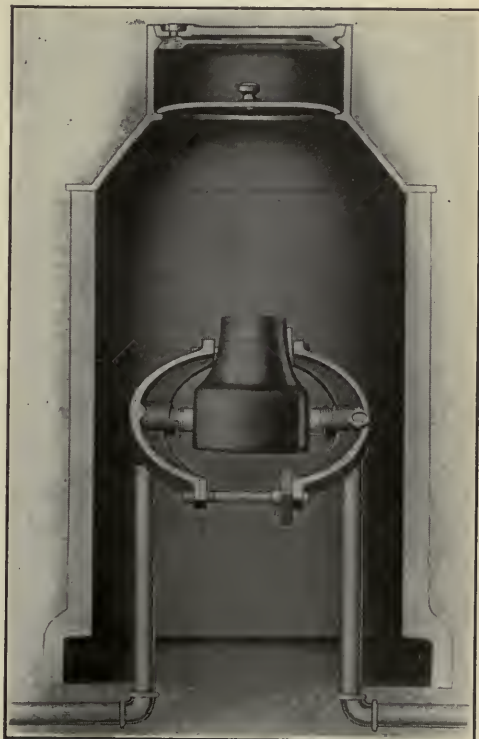
Jacob L. Crane, Jr., has opened an office at 1002 Wrigley Building, 400 North Michigan Avenue, Chicago, Ill., for the practice of municipal engineering and town planning. Mr. Crane has been engaged in this work for some years and spent six months in 1921 collecting city planning data in Europe. He is technical advisor on zoning and city planning in Chicago for the Chicago Real Estate Board.

A New Meter Yoke

The Ford Meter Box Company, 406 South Carroll Street, Wabash, Ind., has recently brought out a new meter-holding yoke to be used in connection with meter boxes. This "Meter Grip" is designed to meet the demand for a cheap and effective meter-holding yoke.

The yoke is designed to be sold at a lower price than regular yokes, but is made of the

best material, selected to stand years of use in damp locations. It is made for meters of $\frac{5}{8}$ - and $\frac{3}{4}$ -inch sizes and may be used with meter-box covers of any type, either single or double lid. The yoke is made plain or with a stop valve on the inlet end, and either plain or with a test valve on the outlet end. Valve-ended types are supplied with bronze-lined stops, and where these are used, the usual curb stop and curb box may be dispensed with.



A COMPLETE UNIT—BOX, YOKE AND METER

The Truth About Drinking Fountains



UNSAFE

No. 1. Vertical stream which permits saliva and waste water from the drinker's mouth to fall back to source of supply. No longer considered sanitary.

UNSAFE

No. 2. Modification of vertical stream. This slight angle is little if any improvement over No. 1.

IMPRACTICAL

No. 3. More sanitary if properly used. However, stream is hose-like with no definite drinking point. Difficult to drink from.

THE PERFECT DRINKING FOUNTAIN STREAM

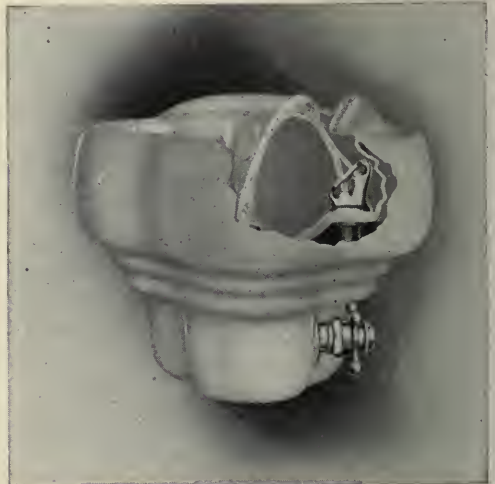
is produced by the famous PURITAN Cantonment "2-stream projector" illustrated in connection with our Puritan 605 Fountain. This stream producing device was designed for, approved and adopted by the Government during the war. Now recognized as superior by the largest interests and schools in the country.

EXCLUSIVE FEATURES

Practical drinking stream!
Automatic stream control—
Stream is never too high. Never too low.



Write for illustrated literature



Puritan No. 605 Vitreous China Wall Fountain

THE HALSEY W. TAYLOR CO. - Warren, Ohio

A New Highway Maintenance Truck

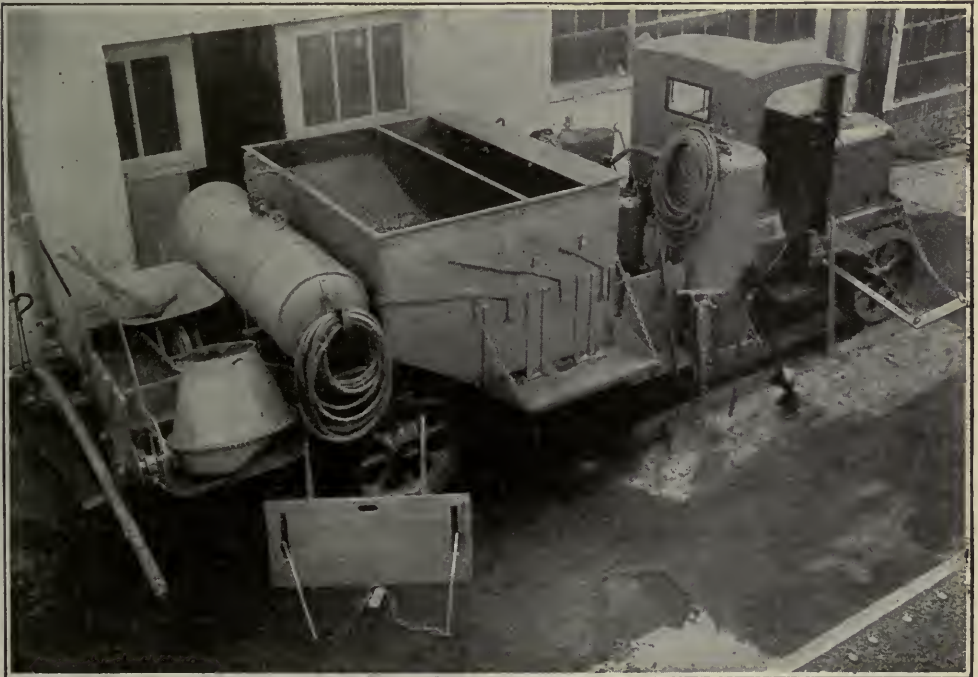
The Board of Supervisors of Kern County, Calif., has been using for some time a Fageol highway maintenance truck made by the Fageol Motors Company, Oakland, Calif. This truck was purchased immediately after the demonstration test given at the concrete highway test track, Pittsburg, Calif. Stanley Abel, chairman of the Kern County Supervisors, stated that in one day's operation of this truck 27 patches were made on the highway, and after charging off the very liberal depreciation with full operating expenses, the cost of doing this with the maintenance truck showed a saving of \$67 as compared with the cost of the same amount of work done by the usual method. It is expected that this truck will pay for itself within the first year's operation.

The Fageol highway maintenance truck consists of a heavy-duty motor truck equipped with an air compressor with a capacity of 80 cubic feet per minute with air receiver and 200 feet of 1-inch air hose and connections. There are combination material bins having a capacity of 1,000 pounds of cement, 1 cubic yard of sand, 2 cubic yards of gravel or rock, all gravity operated and controlled by hand-operated gates to the mixing apron. The water-tank has a capacity of 150 gallons, and discharge is effected by gravity or pressure. The rotary concrete mixer is driven by an auxiliary shaft from the transmission. The centrifugal pump has a self-priming device and suction hose for filling the water-tank from wells, rivers, and other sources. It

has a draw-bar attachment for hauling trailers, and a power-driven niggerhead winch for service when needed. A tar or road oil heating tank with gas burners is included, having a capacity of 50 gallons and equipped with a siphon nozzle for spraying bituminous material under pressure with hose. A large pneumatic jack-hammer with assorted chisels, tampers, etc., a pneumatic post-hole digger and hose, are also provided.

There is an extension side-arm or boom placed at the side of the truck, which is used in hauling a large grading plow with drag or grader when necessary. Additional equipment includes a steel wheelbarrow, one 10-ton jack and bracket, 200 feet of 1-inch manila rope, 25 feet of tow chain, steel stencils for lettering highways, three shovels, two picks, one large sledge, two crowbars, ten red lanterns, ten "At Work" signs and ten red flags.

The truck is thus fully equipped for repairing ruptures or breaks in reinforced or plain concrete, macadam or various bituminous types of streets, as well as erecting fences, assisting in the construction or repair of steel, wooden or concrete bridges and culverts, beveling, grading, and other maintenance jobs on highways, stenciling traffic or ordinance signs, chipping out cracks on concrete highways and sealing with hot bituminous material under pressure, cutting asphalt paving with the pneumatic chisel or jack-hammer, spraying trees and shrubbery in parks with fungicide, and putting out fires along highways. With suction hose and centrifugal pump it can be used to good advantage in pumping out caissons, etc.



THE ROAD MAINTENANCE TRUCK WITH ALL EQUIPMENT SHOWN

PROTECTION

A Standard System of Protective Service Meter Switches



WK-54 Switch equipped porcelain bus-connector block.

WK-54 Switch with meter end arranged for Westinghouse Type OA Watt-hour Meter.

Showing method of banking Switches.

WK-54 Switch equipped with bus-connector straps.



The line of Westinghouse Type WK-54 service meter switches represents a standard system of entrance switches. These switches were designed to meet Central Station demands. Also they afford protection to the service and watt-hour meters by preventing interference or tampering by anyone not authorized to care for them. Testing of the meters can be done with dispatch and without interfering with the consumer's use of his installations.

The terminal chamber of the meter and all the wiring is enclosed in a metallic enclosure under one cover. The switch is operated from the outside, so that it is unnecessary to disturb the

seal on the box or open the cover to operate the switch.

There is ample space in the box for wiring.

Removable knockouts (U sides) are provided in each side of the box to permit the use of wiring troughs for banking meters.

The ends of the box are made to receive all makes of end walls or meter trims for this type of equipment.

A grounding connection is placed inside each box.

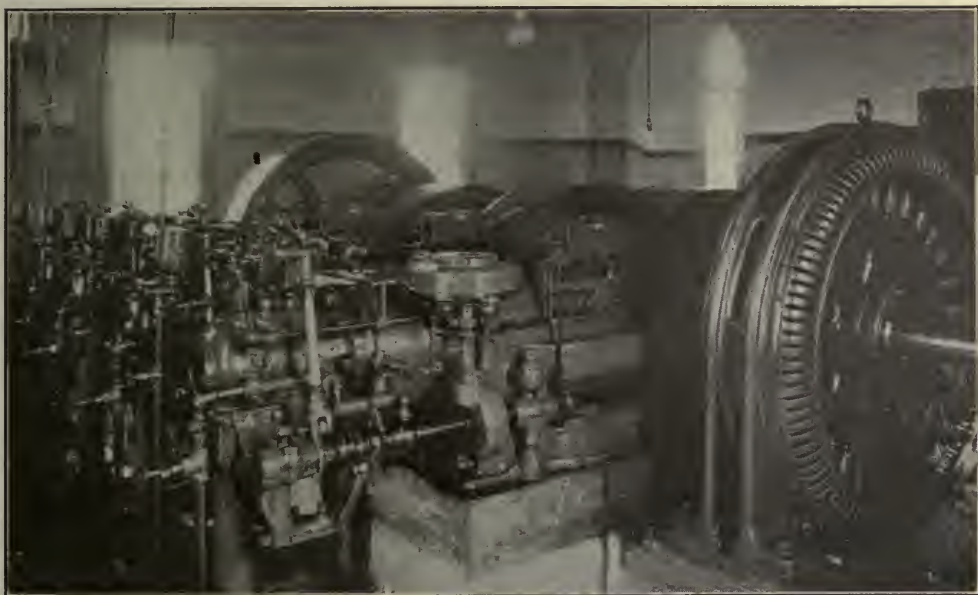
Furnished in capacities of 30, 60 and 100 amperes.

Type WK-54 Service Motor Switches are fully described in Catalogue 12-A

Westinghouse Electric & Manufacturing Company

Krantz Works, 160 Seventh St., Brooklyn, N. Y.

Westinghouse



A 120-H. P. ST. MARYS FUEL OIL ENGINE INSTALLATION IN AUBURN, NEBR.

A New-Principle Diesel Oil Engine

A Diesel engine without the usual air compressor piping, air receivers and needle valves, has quite recently been placed on the market by the St. Marys Oil Engine Company, St. Charles, Mo. The fuel for this engine is not atomized by means of compressed air, as in most Diesel types, but by partial explosion in the cup. The cost of production claimed by the manufacturer is from 20 to 30 per cent less than that of the standard type of fuel oil engines. This is caused by discarding the high-pressure compressor with its piping and receivers, the fuel pump with piping and needle valves, and the expense of erecting these parts.

In operating a 60-horse-power St. Marys engine for 300 10-hour days, approximating one year, the total cost for fuel at 5 cents per gallon is about \$660.30. An interesting installation of these engines is found in the municipal power-plant at Grafton, Ill., where two 30-horse-power St. Marys engines are running two 2,300-volt, 37½-kw. generators. The night load requires the two engines to furnish the required current. No difficulty has been experienced, according to statements of the officials, in starting the engines, and in five minutes they have been able to handle the full load, using about 2 gallons of fuel oil to the engine per hour when operating at full load.

Blackstead Joins Dayton-Dowd

The Dayton-Dowd Company, Quincy, Ill., has recently announced that A. P. Blackstead has joined its engineering staff in the manufacture of centrifugal pumps and fire pumps. Mr. Blackstead was formerly Chief Engineer of

the Camden Iron Works, and prior to that, Hydraulic Engineer with the Henry R. Worthington Company, of New York. He has just returned from Europe, where he spent six months studying conditions and investigating recent developments in hydraulic engineering.

Whitten Opens Cleveland Office

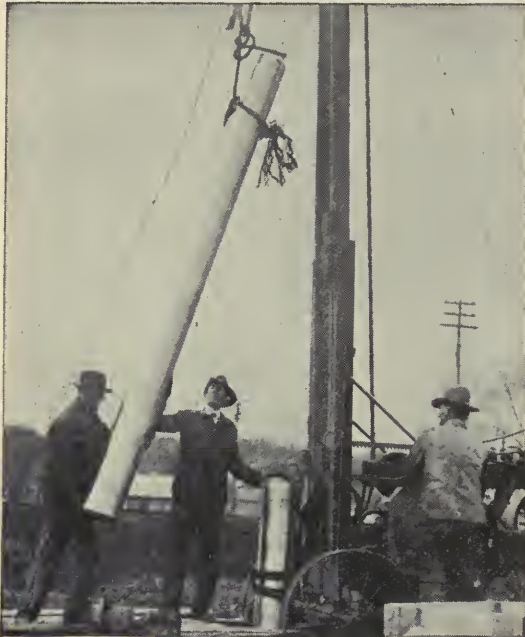
Robert Whitten has announced that he has opened offices at 4614 Prospect Avenue, Cleveland, Ohio, for the professional practice of city planning and city zoning. He will undertake commissions from municipalities and civic organizations for the preparation of comprehensive city plans and their special features, such as zoning plans and ordinances, major street or thoroughfare plans, traffic regulations and ordinances, park and boulevard plans, building line, bill-board and smoke prevention ordinances, and regulations for the approval of plats of land subdivisions.

Pennsylvania State Contract for Culverts

The Canton Culvert & Silo Company, Canton, Ohio, manufacturers of Acme nestable and Imperial riveted corrugated metal culverts, have been awarded the contract for supplying the Pennsylvania State Highway Department's requirements for corrugated metal culverts for this season, as last. The contract approximates 42,000 feet of corrugated culverts.

Central Foundry Moves Up-Town

The Central Foundry Company, manufacturers of Universal cast iron pipe, formerly located at 90 West Street, New York City, have moved up-town to 41 East 42d Street.



Placing a 12" 45-ft. JOHNSON Brass Well screen in the well.

Why do they?

There is a free sample waiting for every interested person who wants to know *why* Johnson Brass Well Screens have them all beat for capacity. If you are one of these persons tell us and we will see that you get yours.

When you plan your well have the screen with the continuous inlet slot where you can look at it. You will see one-half more active intake area and a real honest completely undercut intake slot.

The sample shows in a way which cannot be disputed just why the Johnson is the most valuable well screen. Send for it now.

Edward E. Johnson, Inc.

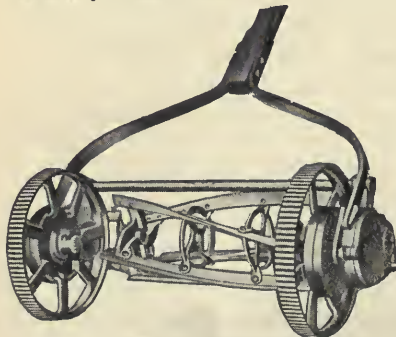
St. Paul, Minn.

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Style "GRAHAM" all steel.
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Practically Indestructible.



LARGEST MAKERS OF HIGH GRADE LAWN MOWERS IN THE WORLD.

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The famous Vanadium Crucible Steel Blades and the Bearings bored to rifle barrel accuracy, are features that have made the name "PHILADELPHIA" worth remembering when buying Lawn Mowers.

So great is the demand we are compelled to make "PHILADELPHIA" Mowers in

18 Styles HAND, 4 Styles HORSE, 3 Styles MOTOR
ALL HIGHEST GRADE POSSIBLE TO BUILD
A MOWER FOR EVERY PURPOSE

Send for catalog NOW.

If your hardware dealer or seedman cannot supply you, send to us direct.

The Philadelphia Lawn Mower Company

31ST AND CHESTNUT STS.,

PHILADELPHIA, U. S. A.

Tubular Steel Lamp Standards

There has been much talk about the danger of shattering street lighting standards by trucks or automobiles which are intentionally steered over the curb line to prevent collision with other vehicles or pedestrians. To overcome these objections the Electric Railway Equipment Company, Cincinnati, Ohio, has brought out the Safety First standard which is illustrated herewith. This standard is claimed to be practically unbreakable, as the shafts are made from open-hearth, lap-welded steel tubes, having a tensile strength of over 50,000 pounds per square inch and assembled with a patented "wire lock" joint. The standard illustrated is equipped with a General Electric Form 8 Novalux top and measures 10 feet 6 inches from the ground line to the center of the light source. The base is 13 inches in diameter and the shaft $4\frac{1}{2}$ and $3\frac{1}{2}$ inches in diameter.

New Central Station for Amory, Miss.

A bond issue of \$90,000 has been authorized to finance a new complete light, water and power plant in Amory, Miss. The new power-plant machinery will consist of one 3-cylinder, 175-b.h.p. engine, and one 4-cylinder, 225-b.h.p. engine, both of the vertical 4-cycle Fulton Diesel type made by the Fulton Iron Works Company, St. Louis, Mo. The smaller engine will be direct-connected to a 146-kv.-amp., 117-kilowatt, 8 P.F., 2,300-volt, 60-cycle, 3-phase, alternating-current generator with belted exciter. The larger engine will be direct-connected to a 187½-kv.-amp. generator of the same type with belted exciter. A well-lighted brick and concrete building of ample size is to be erected for the new machinery, and space will be provided for a future third Diesel engine.

It is interesting to note that although Amory is nearer to the coal fields than to the oil fields, it was shown by F. G. Proutt, of Memphis, Tenn., city consulting engineer, that with Diesel engines the net income on the light, water and power system would be more per dollar invested than with any other type of equipment.

Hotel Financing

The modern hotel is becoming more and more not only a community social center, but the symbol of the type of hospitality the community extends to the traveler. The present is by no means a stay-at-home generation. Improved highways carry an increasing number of travelers over the country, making hotels a distinct asset to a municipality. As travel has increased, there has been a growing tendency to classify cities upon the basis of their hotels. The public, as a result of its journeying, has come to realize the truth of Samuel Johnson's observation that "there is nothing which has been conceived by man by which so much happiness is provided as by a good tavern or inn."

Community financing in connection with hotel promotion is coming rapidly to the front as an accepted procedure. An increasing number of cities and towns are taking pains to protect their good names by establishing a community interest in the hotels that represent them. In this connection the announcement that Harvey J. Hill and Arnaud C. Marts have retired from the firm of Ward, Hill, Pierce and Wells, and formed the Hotel Financing Company, 1 Madison Avenue, New York City, in order to devote themselves to the work of financing hotels upon the basis of community participation.

The modern hotel is a force for democracy whose importance and influence few of us fully realize. A list of the events scheduled at many of our hotels in wide-awake communities indicates the great range of their local service. Practically every sort of organization, from a chamber of commerce to a literary society, makes the hotel its regular meeting-place. In addition, the modern hotel is the scene of innumerable social functions. Whatever may be the limitations imposed on the modern flat-dweller by the housing problem, the hotel offers to all members of the community alike opportunities and accommodations for sociability appreciated by the individual, as well as necessary to folks in the mass. The hotel has made it possible to overcome many social difficulties that would otherwise be insurmountable.

This is only one phase of the service rendered by hotels from the community point of view. It would be quite enough to stimulate community interest in the hotel were there no other basis for it. But the hotel is the right hand that each community extends to welcome the stranger within its gates. It is possible for a poor hotel to undo in five minutes all that the community boosters have accomplished in the space of a year. Community-promoted hotels are now recognized institutions, and conservative, dependable methods of financing them are a distinct contribution to community welfare.

General Chemical Moves Office

The General Chemical Company, manufacturers of Hard-n-Tyte, a chemical for producing stronger concrete, have moved their offices from the Broad Exchange Building, New York City, to 40 Rector Street.



A Lighting Standard Difficult to Shatter



A reduced section of the New York City Mosaic Map showing Columbus Circle district.

**The Fairchild Aerial
MOSAIC MAP
—a new big factor in
city development plans**

A Mosaic Survey is made by taking and assembling a series of overlapping vertical aerial photographs, resulting in a complete map, perfect in detail and mosaic in character.

The City of Newark, N. J., has recently contracted for a Fairchild Aerial Mosaic Survey because copies of the map will prove an invaluable aid to:

1. City Plan Board
2. City Engineer
3. Tax Assessor
4. Schools
5. Police and Fire Department
6. Building Department
7. Bureau of Information
8. Civic Organizations

DO THIS TODAY—Write for large gravure reproduction of New York Mosaic Survey—and one of the sectional photographs used in making this map. Sent **FREE** to any interested official. _____

**FAIRCHILD
AERIAL · CAMERA · CORPORATION**
136 West 52nd St., New York

**Position Wanted as
CITY MANAGER, CITY ENGINEER,
OR CHIEF ENGINEER**

Engineer of long and varied executive experience wishes position as City Manager or City Engineer, or as Chief Engineer or Supt. of municipal department or private corporation. 14 years executive head and chief engineer of large department in city of over 500,000 and of an Industrial and Power Co. 12 years' practice as consulting civil, hydraulic, sanitary, and power engineer. Address Box 89, The American City, Tribune Bldg., New York City.

**REGISTERED ENGINEER
(Michigan)**

Well qualified in municipal engineering, wishes new location. Five years' intensive experience in water works, sewerage, sewage disposal and the preparation of plans, drawings, specifications, and estimates for pavements, side walk, bridges, surveys, and the preparation of contracts.

Box 90, The American City, Tribune Bldg., New York City.

Wanted

Applications for City Manager
by the

**City of Onaway,
Mich.**

WILL B. GREGG,
City Clerk.

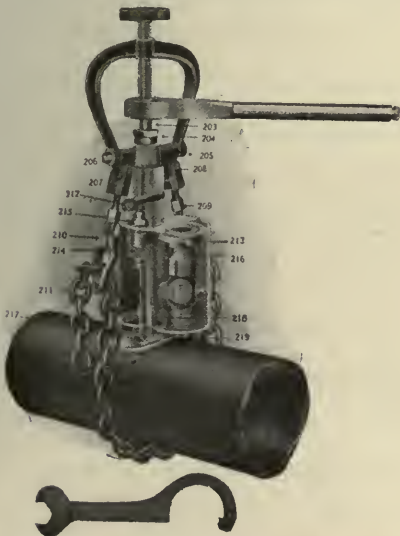
**CITY MANAGER
OR CHAMBER SECRETARY
AVAILABLE**

A high grade, public spirited man, 32 years old, university graduate, widely experienced in newspaper, publicity and organization work, is available for city manager or chamber of commerce work. Box 88, care American City, Tribune Bldg., New York.

A Tapping Machine for Water-Mains

The tapping machine illustrated herewith is the invention of Walter S. Payne, who for a number of years was a Superintendent of Water-Works and has been for a long time in the business of manufacturing water-works supplies. This new Eclipse tapping machine is made by the Hays Manufacturing Company, Erie, Pa. It is claimed that this machine has reduced the process of tapping water-mains under pressure to its simplest form, as there are no valves or pet-cocks to get out of order, and no revolving heads to get sprung or joints to leak. The pressure or strain of the feed screw pulls directly on the chain, thereby relieving the machine of undue strain. The machines are made of bronze metal with saddles of malleable iron.

In using this machine, the corporation cock is screwed into the mandrel or bushing by means of a spanner wrench which goes with each machine for this purpose. Then by means of a handle the crane is swung around over the opening in the bottom of the machine, and the mandrel is screwed firmly into the crane by means of the wrench. The crane, with the mandrel and cock in it, is then swung around into the recess, and the handle is folded up to prevent the crane from swinging back. Following this, the combined tap and drill is put into the machine. The saddle, with a gasket under it, is put onto the main, and with another gasket in the saddle the machine is set onto the saddle. The tightening bolts are unscrewed far enough out of the clevis and harp to give room for taking up all slack in the chain. The ends of the chain are passed through the harps and then the chain is tightened by means of a wrench applied to the tightening bolt. These bolts have a right-hand thread at one end and a left-hand thread at the other, so that they tighten up rapidly.



A MACHINE FOR TAPPING WATER-MAINS

When this is done, the ratchet is put on the drill, and the feeder yoke is swung into position. Then the feeder screw is tightened until there is the proper pressure on the drills. After the hole is drilled and tapped, the tap is drawn up into the machine as far as possible through the stuffing box. The handle is then opened and the crane swung around so that the cock and mandrel come immediately under the tap and drill. Then the operator pushes down on the tap and drill and screws it into the mandrel until it is tight, continuing until it unscrews the mandrel out of the crane. When it is thus released, the cock is pushed down into the opening in the main and screwed in by means of the tap, using a ratchet to turn it in. The chain is then loosened and the machine taken off, a wrench is put onto the cock, screwing it into the main securely, and then the tap and mandrel are unscrewed from the cock.

Kelly-Springfield Changes Sales Policy

The Kelly-Springfield Tire Company has recently consolidated its general offices in the new building at 250 West 57th Street, New York City. The New York Branch has been removed to the company's warehouse at 553 West 57th Street, New York City, which is equivalent to giving up the branch altogether, since it has no display rooms, sales counters or any of the other appurtenances of the usual tire store. The company has discontinued all retail sales in order to protect dealers.

The company intends to establish warehouses in various centers of distribution where railroad facilities are best suited to give prompt service to its dealers. In places where it now maintains branches, these will be supplanted by offices, which in many cases will be in the warehouses themselves.

Benham Engineering Company

Webster L. Benham has announced that under the firm name of Benham Engineering Company, Consulting Engineers, 215 Gumbel Building, Kansas City, Mo., he has taken over all contracts of Benham & Mullergren and will continue to act as a consulting engineer on water-works, sewers and sewage disposal, electric light and power plants, street paving and valuations. A. L. Mullergren retires from the firm and will engage in private practice, specializing in electric light and power plant engineering and public utilities, with his office at 555 Gates Building, Kansas City, Mo.

New Pumper for Nashville, Tenn.

We acknowledge an error appearing on page 204 of the April, 1922, issue of THE AMERICAN CITY, where a notice was given of a 1,300-gallon Ahrens-Fox auto pumping engine delivered to Newport, Ky. This should have read Nashville, Tenn. The tractor for the aerial truck was delivered to Newport, Ky.



Find the Solution to

YOUR SWEEPING PROBLEMS

in this Catalog

Other cities are saving time, labor and money by using Austin Motor Sweepers and are enjoying cleaner streets to boot.

You might just as well be doing it too.

Write for Special Motor Sweeper Catalog G today.

THE AUSTIN-WESTERN ROAD MACHINERY CO.

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Branches in Twenty-three Cities



"Everything from a drag scraper to a road roller"

Do You Want Prices on Anything?

READERS of THE AMERICAN CITY desiring to secure catalogues or price lists on any sort of machinery equipment or supplies for municipal or county work are invited to state their wishes to the Catalog and Price List Department, The American City, Tribune Building, New York. One letter to us will secure you the information you desire free of all charge, and at a considerable saving of time and correspondence.

Volume

XXVI

Number 6

The American City Magazine

New York

June

1922

Planning for an Urban Population of Thirty-Seven Millions

Sage Foundation Announces Regional Planning Study Covering Three Hundred
Communities in New York Area

A FAR-REACHING project to make the metropolitan district around New York City a more livable community has been undertaken on the initiative of the Russell Sage Foundation. The enterprise entails a comprehensive regional plan embracing the entire area from Bridgeport to West Point,

thence to Princeton and on down the Jersey coast, including all of Long Island. Three states and 300 cities, towns and villages are thus involved—the most densely populated domain on the hemisphere.

To this end the Trustees of the Foundation have named a committee of direction for The Plan of New York and Its Environs consisting of Charles

D. Norton, chairman; Robert W. DeForest, Frederick A. Delano, John M. Glenn, Dwight W. Morrow, and Frank L. Polk, with Frederick P. Keppel as secretary, and Flavel Shurtleff, assistant secretary. Announcement of the appointment of the committee was made on May 10 at a meeting of architects, engineers, artists, city planners

and community workers held in the Engineering Societies Building, at which Elihu Root, Herbert Hoover, Miss Lilian Wald, of the Henry Street Settlement, and Brigadier General Carty, of the New York Telephone Company, were speakers.

The Sage Foundation, which by the terms of its deed of gift must devote a considerable part of its income to the improvement of New York and its vicinity, will support the committee financially during its preliminary studies. It is the plan of the committee, however, to democratize the movement and invite the aid and cooperation of all individuals or bodies whose aims lie in the same direction. Already such citi-

zens as Herbert Hoover, Charles E. Hughes, William Howard Taft and Elihu Root have been consulted and have given the project their endorsement and active assistance.

It Lights the Imagination

The first impression produced by the plan will undoubtedly be the extraordinary scope

Draw all the lines you please for states and counties, but a city is a growth, responding to the inherent atoms that make it up, apart from political or governmental considerations. The force from which that growth comes is the force of individual enterprise, desire, movement—the desire for a living, desire for wealth, comfort, society, acting in the hearts and minds of a vast number of units. That is the great force of life and modern civilization, and that is the thing that government cannot imitate.

—Elihu Root, May 10, 1922.

of the undertaking, and many will ask why such an extensive territory was selected. The answer, drawn from experience everywhere, is that no limited or timid plan could achieve the expected and necessary results. The smaller cities around New York are affected by it in many ways. Yonkers cannot properly analyze its own traffic congestion, White Plains its housing problem, Passaic its sewage problem, or Stamford its paving program without recognizing the existence of the problems created by the whole metropolitan district. Little plans interest little groups and are lost before they can make themselves felt. It is necessary to light the imagination of all who live in, by, or around New York, to make them think as a unit, before success is in sight.

The late Daniel Burnham, greatest of city planners in our generation, said:

"Make no little plans; they have no magic to stir men's blood and probably themselves will not be realized. Make big plans, aim high in hope and work, remembering that a noble, logical diagram once recorded will never die, but long after we are gone will be a living thing, asserting itself with ever-growing insistency."

With such an end in view, involving as it does the legal and physical barriers of three states and 300 communities, there is obviously no body or commission, federal, state or local, which could ever attack the problem in any effective way. At the present time, and during the preliminary inquiry which has been under way for a year, emphasis is not laid on solutions or remedies, but on the problem itself.

Into the already congested area of New York every day pour millions of workers from outlying points and additional thou-

sands of visitors from all over the United States. New York's mad and illogical development, forced on it to a certain extent by prosperity, has resulted in such abnormalities as a mile or so of East Side sheltering two millions of people, with thirty-two square miles of wilderness across the Hudson only six miles away.

A Wise Expenditure

Of course, the cost of solving such a problem will be very great, but experience everywhere has demonstrated that the cost of *not* solving it has been, and will continue to be, much greater, for, if the figures of the engineers are not too conservative, the district will have a population of over 37,000,000 by the year 2000. The point is, that the money for improvements will be spent anyhow, whether there is a comprehensive plan of guidance or not. If, however, there is no plan, civic improvements are undertaken belatedly or at haphazard and at intervals have to be replaced, reorganized to meet de-

The enormous losses in human happiness and in money which have resulted from lack of city plans which take into account the conditions of modern life, need little proof. The lack of adequate open spaces, of playgrounds and parks, the congestion of streets, the misery of tenement life and its repercussions upon each new generation, are an untold charge against our American life. Our cities do not produce their full contribution to the sinews of American life and national character. The moral and social issues can only be solved by a new conception of city building.

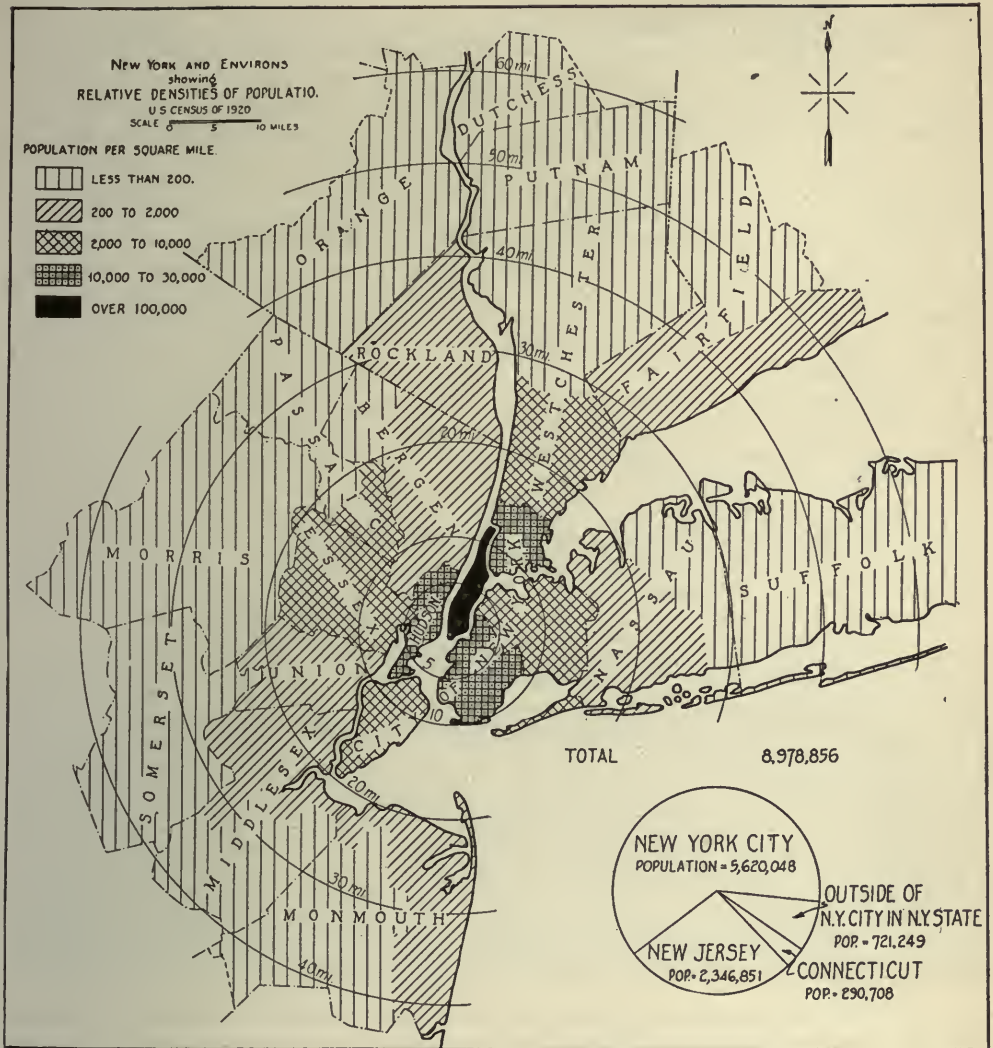
The vision of the region around New York as a well-planned location of millions of happy homes and a better working center of millions of men and women, grasps the imagination. A definite plan for its accomplishment may be only an ideal. But a people without ideals degenerates—one with practical ideals is already upon the road to attain them.

—Herbert Hoover, May 10, 1922

velopments not provided for, or expensively modified in one or another of a hundred ways. Funds expended unnecessarily and without due consideration would provide for the realization of a sound plan for any city within a decade.

The method of approach which the committee selected as best calculated to yield sound results is a quadruple survey. Its four phases, each in charge of the best procurable experts, are:

1. Economic and industrial
2. Physical
3. Legal
4. Social and living conditions



RELATIVE DENSITIES OF POPULATION IN THE NEW YORK DISTRICT

Both the physical and legal surveys are under way, and the former is well advanced. This has been pursued under the direction of Nelson P. Lewis, for years Chief Engineer of the Board of Estimate and Apportionment, former President of the American Society for Municipal Improvements, and now Vice-President of the American Society of Civil Engineers.

The physical survey deals with the rail facilities of the port; the closely related questions of shipping facilities, with all the present congestion of freight; the main highway system of the entire area, including the bridges over, and tunnels under, the

water barriers; the park and recreational facilities; the location of public and semi-public buildings with due respect to natural civic centers; and an investigation of the possibility of decentralization—establishing industries outside of existing congested areas, with provision for the suitable housing of employees in such industries.

The legal survey, dealing with intricate questions of state and civic jurisdiction, tidal lands, zoning, excess condemnation and the like, is under the direction of Edward M. Bassett, Counsel of the New York Zoning Committee, with Charles E. Hughes as one of a committee of advisors.

It is expected that the economic and social surveys will be begun shortly. Their main object will be the same as that of the other two—to lay down an approach toward solving the civic and communal problems of the average man, to give him better, cleaner and more beautiful surroundings, and to develop his neighborhood interest into a regional view-point.

As to remedies for existing conditions which admittedly require treatment on an heroic scale, the committee is at present reticent. The first consideration is to establish the facts with a thoroughness that precludes dispute.

In all likelihood, the solution or solutions will not spring from a single mind nor be entrusted to an individual, as has been the case with many American and European city plans. More probably the Plan of New York and Its Environs will be the work of a team of architects, engineers and artists, each preeminent in his particular field.

The principles on which the committee

must proceed, however, already appear. In the very nature of things, and by reason of the physical conformation of New York and its environs, one of the chief problems will be that of the water-front and the miles and miles of shore lines which serve the many cities in the district. In matters of traffic and transit, of course, emphasis will be laid on diffusion as against concentration, upon extinction of barriers, and ease of access from one district to another. Focal points must be duplicated rather than enlarged beyond the possibility of accommodation, and there must be a coordination of development throughout the zone.

The committee is in no sense a self-centered organization relentlessly committed to its own ideas. It is acutely aware that only by united effort and by the fullest cooperation on the part of all concerned—which means the whole population of the region and the official civic units which represent it—can such a plan be prepared and carried into effect.

Why Women Are in Politics

The Opinion of Lady Astor, M. P., as Indicated in Her Address Given at the Town Hall, New York City, April 19

“WHY are we in politics? What is it all about? Something much bigger than ourselves. Schopenhauer was wrong in nearly everything he wrote about women—and he wrote a lot—but was right in one thing. He said, in speaking of women, ‘The race is to her more than the individual,’ and I believe that it is true.

“I feel somehow we do care about the race as a whole. Our very natures make us take a forward vision. There is no reason why women should look back. Mercifully, we have no political past. We have all the mistakes of sex legislation with its appalling failures to guide us. We should know what to avoid. It is no use blaming the men. We made them what they are, and now it is up to us to try to make ourselves—the makers of men—a little more responsible.

“Personally, I feel that every woman should take an active part in local government. I don’t mean by that that every woman should go in for a political career.

That, of course, is absurd; but you can take an active part in local government without going in for a political career. You can be certain when casting your vote you are casting it for what seems nearest right—for what seems more likely to help the majority and not bolster up an organized minority.

“There is a lot to be done in local politics, and it is a fine apprenticeship to central government; it is very practical, and I think that, although practical, it is too near to be attractive. The things that are far away are more apt to catch our eye than the ones which are just under our noses. Then, too, they are less disagreeable.

“Let the men see that we desire a better, a safer and a cleaner world for our children and their children and that we realize that only by doing our bit, by facing unclean things with cleanliness, by facing wrongs with right, by going fearlessly into all things that may be disagreeable, we will somehow make it a little better world.

Flat Rates Caused Water Waste

Lawton, Okla., Reduces Cost of Operation of Water-Works and Cuts Water Waste by Gradual Compulsory Metering

By Gilbert S. Fraser

Superintendent of Water Department, Lawton, Okla.

THE Lawton Water Department represents the largest single investment in the city and is considered one of the best water-supplies in the state of Oklahoma. It has a valuation of \$1,096,468 and an indebtedness of \$904,393. Its distribution system includes 87 miles of cast iron mains, ranging in size from 24 to 2

dition to another 16-inch main. Both together can deliver to Lawton 6 million gallons daily.

At the lake there is a modern rapid sand filtration plant of 5,000,000 gallons daily capacity, built at an initial cost of \$158,000. The plant was installed by the International Filter Company. There are two



THE LAWTON, OKLA., FILTER PLANT AND STORAGE TANKS

inches in diameter. The present source of supply is in the Wichita Mountains, where at a cost of \$149,762.67 a 60-foot dam was constructed across Medicine Creek near Lake Lawtonka, the present reservoir, 14 miles from the city. The dam is 52½ feet wide at the base, 18 feet through the central section, 10 feet wide at the top, and 375 feet in length, which gives a basin capacity of 9 billion gallons of water, covering 1,408 acres at an average depth of 18 feet.

Two water-mains provide ample facilities for bringing the water to the city and to Fort Sill, the United States military reservation located near-by. A 24-inch main has a capacity of 12 million gallons at Fort Sill, and a reduced main coming into Lawton a capacity of 3 million gallons, in ad-

dition to another 16-inch main. Both together can deliver to Lawton 6 million gallons daily. At the lake there is a modern rapid sand filtration plant of 5,000,000 gallons daily capacity, built at an initial cost of \$158,000. The plant was installed by the International Filter Company. There are two clear-water tanks of 200,000-gallon capacity each, two raw-water tanks of the same size, ten filter-beds of 5,000-gallon capacity each, and four 300-gallon alum tanks. Two Van Blerck gas motors provide the power to operate the plant and wash the filters. The sand-beds are washed every eight hours with two Lea-Courtenay 2,700-gallon-per-minute pumps. The water is sent to the filter by gravity pressure, and from the filter to the city by the same means, giving between 75 and 80 pounds pressure at the City Hall, fourteen miles away, with no pumping whatever. The plant has a Bessemer oil engine of 185 horse-power and three Allis-Chalmers pumps of 1,500-gallon-per-minute capacity each, with which to force the water from the lake to the filtration



LAKE LAWTONKA, LAWTON'S NINE-BILLION-GALLON WATER-SUPPLY RESERVOIR

plant, should the water at the dam ever drop as low as the 10-foot level—which is very improbable, inasmuch as it has been estimated that the lake impounds a three-year supply of water if no rain falls during that period. Electric lighting facilities are supplied by a 6-horse-power gas engine, a Watson 250-volt, direct-current generator, one alternating-current generator, and one electric induction motor, type C.S., 40 horse-power and 220 volts. Two million eight hundred thousand gallons represents the average daily amount of water filtered. In the winter the only chemical treatment the water receives is alum. In the summer the lake is treated in sections with copper sulphate to kill off the blue-green algae which abound during the hot months; liquid chlorine is also used. All water is subjected to laboratory analysis according to the Standard Methods of Water Analysis, American Public Health Association.

During the fiscal year 1921, 1,134,400,000 gallons were filtered and delivered to Fort Sill and Lawton at an average cost of \$0.0906 per thousand gallons. The total operating cost for this period was \$35,263.58; of this amount \$14,108.58 was chargeable to the filtration plant, which was at that time under Government control. The depreciation cost for the same period, figured on the basis of 2 per cent on the distribution system, 1 per cent on the grav-

ity flow lines, 2 per cent on the dam, 10 per cent on the chlorinating and laboratory equipment, and 10 per cent on the filtration plant, amounts to \$23,536.06. Interest on the outstanding bonds and indebtedness was \$44,016.29. The entire cost to the city for interest, operation and depreciation was \$102,815.93, and the total receipts for this period were \$61,530.38, indicating that the department operated at a loss of \$41,285.65.

Losses Caused by Water Waste

On August 1, 1921, the city abolished the commission form of government and employed a city manager and a new superintendent of the Water Department. A careful study of the water-works showed that the major portion of the deficit was chargeable to water waste. There were only seventeen meters in operation in the city, and the average daily per capita consumption was 291 gallons with no factories in operation. All residences and most of the business houses were using all the water they desired at a flat rate of but \$1 per month. Considerable public sentiment was found bitterly in opposition to the use of meters. In spite of this, meters are being installed in the business section of the city and are already bringing about increased revenue and pressure.

Under the present supervision the operating costs of the Department for the fiscal

year ending June 30, 1922, will be \$16,-585.26, depreciation costs \$23,536.06, and interest cost \$45,939.69. The entire cost of the Department to the city will be \$86,-060.97. On the present basis, the revenue from water will be \$71,605.92, the revenue from pasture rental, hay cut on the watershed, and fishing and hunting permits, \$6,-196.43, making a total revenue obtainable of \$77,802.35. In addition to this, the Department supplied water to the public schools, city parks, municipal swimming pools, Indian hospital, Indian school, city buildings,

fire hydrants, street cleaning, and sewer flushing in an amount aggregating \$4,123. This brings the total earning power of the Water Department for the year up to \$81,-925.35, indicating that the Department will operate at a loss of \$4,135.62 this year as compared with the loss of \$41,285.65 of last year. With the improvement made this year, it would be no prophecy to state that the Department, next year, will not only meet all of its expenses, but will actually produce revenue to be paid into the city treasury.

Schools Lead Fight Against Mosquitoes in Bonham

By L. H. Rather

Superintendent of Schools, Bonham, Tex.

PAINFULLY aware of the discomfort and illness caused by the swarms of mosquitoes that regularly infested Bonham during summer and fall, and desirous of rendering real civic service, the pupils of the biology class in the High School decided in the spring of 1921 to secure information that would be useful in waging war against the winged pests. It was agreed that the data should be gathered solely by the pupils, under the supervision of their instructor, and that the tabulation of the results of the investigation should be considered a part of the regular laboratory work of the biology class.

The investigation, or "Mosquito Campaign," as it was popularly called, had as its objects the discovery of all breeding-places of mosquitoes, the noting of all defective screens, the locating of houses without screens of any kind, the tabulation of the results gained, and the dissemination of the information among the inhabitants of the city. Accordingly, Bonham was divided into districts, and certain members of the biology class were set the task of investigating thoroughly the districts assigned them. In order that the work might be done with dispatch, the various groups of pupils left the High School building each day and devoted the time customarily employed in carrying on experiments in the laboratory to making excursions to the dis-

tricts assigned them for investigation. Instructions were given each group of pupils to report on the following points at the end of each daily excursion:

1. Premises having stagnant pools of water, garbage piles, or other breeding-places of mosquitoes
2. Pools, discarded cans, old barrels, and the like, in which mosquito larvae were found and which needed an application of oil
3. Homes or business houses having defective screens or without screens entirely

The results of the investigation were startling. When the work, which required about one hour per day for ten days, was completed, it was discovered that the premises of more than 1,800 homes and business houses had been examined. The number of places where stagnant water needed drainage was 51. Mosquito larvae were found in 25 pools of water, and 51 pools and rain barrels needed an application of oil. Weeds, mainly on vacant lots, serving as harbors for mosquitoes, needed to be cut in 159 places; and 247 piles of garbage were marked as worthy of removal. Finally, 425 homes were discovered with defective screens or with no screens at all.

Spots Where Action Was Needed

To make the information gained by the investigation easily accessible and of practical value to all the inhabitants of the city, a map of Bonham was prepared by the boys

Atlanta Adopts Zoning

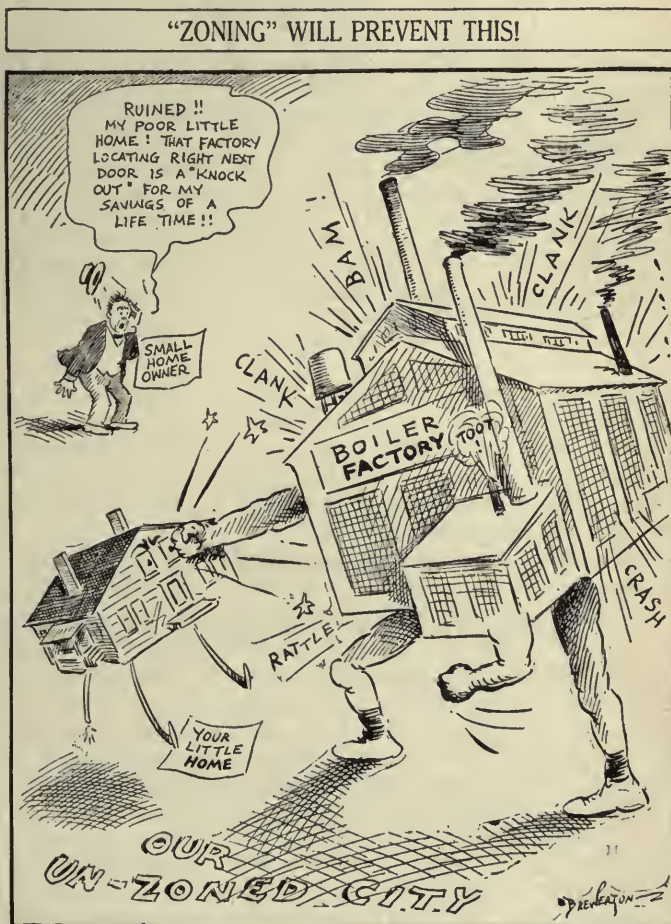
By Robert Whitten
City Planner, Cleveland, Ohio

THE Atlanta Plan Commission started its work with the selection of a consultant in May, 1921. It was decided that the first step in a comprehensive planning program should be the preparation and adoption of a zoning plan and an ordinance. This determination was partly based on the fact that limited finances made it impossible to carry forward simultaneously all parts of a complete city planning program. It was believed that for a limited expenditure of money there was no investment from which the returns would be so great as from a zoning ordinance. It was felt, too, that the educational work in connection with the zoning and the record of practical achievement secured would greatly facilitate the carrying through of the other parts of the comprehensive planning program.

Atlanta, in common with all other municipalities of Georgia, was without zoning powers. The Legislature meets in July of each year, and in 1921 a zoning act, applying solely to Atlanta, was drafted and introduced, becoming effective in August. This act, besides giving comprehensive zoning powers, provides for a board of zoning appeals and permits a court review of any decision of such board. This gave the Commission a sound foundation for its zoning work.

In November a tentative draft of a zoning plan was submitted to the Commission. Early

in January, 1922, a plan and proposed ordinance were approved by the Commission and transmitted to the Council. Five thousand copies of the zoning maps and of an attractive report describing the zoning and the reasons therefor were printed and distributed. The Council, after giving 30 days' notice, as required in the enabling act, began hearings before its Ordinance Committee. These hearings were continued from time to time and covered a period of six weeks. On March 31 the Ordinance Committee, by a vote of 4 to 1,



THIS CARTOON FROM THE ATLANTA JOURNAL OF MARCH 30, 1922, PROVED TO BE A "KNOCK-OUT"

FUTURE ATLANTA--WHAT SHALL IT BE?



THIS CARTOON APPEARED THE DAY THE ORDINANCE CAME UP FOR FINAL ACTION

approved the zoning ordinance, and on April 10 it was adopted by the Council by a vote of 24 to 3. Mayor Key signed it the following day.

The ordinance was bitterly opposed by a few who considered it a gross invasion of property rights. The real estate board sup-

ported it strongly and it had the approval of the Chamber of Commerce and of the various neighborhood clubs. Its constitutionality was vigorously assailed, but this was effectively offset by a written opinion from City Attorney Mayson holding that zoning as a whole is legal and that, while there are arguments on both sides, zoning, being in the line of progress, must eventually receive the sanction of the courts.

The most effective part of the educational campaign to offset the original indifference or opposition of the public was carried on through the daily press. For a period of about six weeks the news columns and the editorial pages gave most efficient and liberal support. The cartoonists, too, helped immensely in putting the zoning across.

Atlanta is the first southern city to adopt a comprehensive zoning

plan. Partly because zoning is new in the South, the classifications and regulations contained in the Atlanta ordinance as finally revised for the Ordinance Committee were made as simple and brief as possible, and yet retained the essentials of a complete zoning plan.

Saving in Property Values by Chicago Zone Plan

That a saving of approximately \$1,000,000,000 in property values will be made within the next generation as a result of the zoning plan now being prepared in Chicago was estimated by Charles Bostrum, chairman of the Chicago Zoning Commission, at a meeting of the American Civic Association in that city.

Edward H. Bennett, director of zoning work in Chicago, explained how the saving will be made. "What we are trying to do

is to create conditions favorable to industrial enterprise, to the protection of business, and the improvement of working conditions," he said. "This necessarily takes time. But it is well worth it. Zoning, we believe, will save approximately \$1,000,000,000 by preventing property depreciation and in increasing property values within a thirty-year period, including ten years back and twenty years ahead."

—Toledo City Journal.



MRS. ABBY HOWE FOREST

*Underwood & Underwood, N. Y.*

DR. AMY KAUKONEN



MRS. A. K. GAULT

What Are Women Mayors Doing?

By Mildred Adams

WHAT are the fifteen women mayors in America thinking of? Why did they run for office? What will they do now that they are in? Will they be city governors, city managers, or city politicians? Will there be any difference between their régime and that of the generations of men who have held the same office?

The towns they are governing range in size from Rochester, Ohio, to which the census credits 145 residents, to St. Peter, Minn., which has 4,335. They are bounded on the east by Brewton, Ga., and on the west by Langley, Wash., which is another way of saying that there are women mayors scattered all over these United States, from one coast to the other.

How Were They Elected?

For people who believe that city government should not be a matter of politics, but rather a matter of businesslike administration, there is great encouragement in the fact that none of the women mayors seem to have run for the sake of politics. In one or two cases they were put into office whether they would or not. Mrs. A. K. Gault of St. Peter was appointed by the City Council, all of whom were men, after the elected mayor had refused to qualify. Mrs. Abbie Howe Forest of Thayer, Kans., writes that she and five other women were made candidates for city offices without

their knowledge or consent, and were elected over two other tickets. She is Mayor, Mrs. Hattie Brewster is Police Judge, and all the members of the Council are women. Part of Mrs. Forest's letter gives the clue to a situation which frequently exists in small towns, and which forecasts more women in elected city offices. She says, "I might say here that our election was due to the fact that in small towns men best fitted for public office often refuse to serve on the plea that they would 'hurt their business.' We had no business to hurt." Mrs. Grace Miller is Mayor of Jackson, Wyo., and with her is an entire council of women. They made no campaign for election, but they did criticise the existing government, and in the opinion of a Wyoming resident, the men "passed the buck by nominating them." The success of their régime is indicated by the fact that they have all been reelected, and that Miss Pearl Williams, town marshal, has resigned because the town is so quiet it doesn't need a marshal any more!

What these women and their sister mayors have already accomplished forms the only reliable index of the kind of thing they may be expected to do. And it is merely an indication, not a rule or a limit. There seem to be two main lines of accomplishment—a physical city-cleaning, and a moral clean-up. Some mayors lay stress on one, some

on the other, and some of them are engaged in both.

Municipal Housekeeping

Mrs. Miller and her sister officers of Jackson began their city house-cleaning by clearing Jackson's water-supply. Pure at the source, it ran through the town in an open ditch, gathering en route much beside clean city water. The women have substituted an adequate piping system from the spring, and have thereby improved not only Jackson's health, but also its streets. They have also paid off the mortgage on the cemetery, built adequate roads, and established a city park.

The "petticoat government" of Thayer, Kans., also has been concerning itself with parks, cemetery and roads, in the manner of good engineers.

Mrs. A. K. Gault has been a moral cleaner. The outstanding feature of her first year as Mayor of St. Peter, Minn., has been the enforcement of prohibition and the licensing of soft drink parlors. Both feats aroused very bitter opposition.

No one of these mayors has received as much publicity as Dr. Amy Kaukonen of Fairport, Ohio. Situated on the shore of Lake Erie, Fairport did a thriving business in illegal liquors. It was easy to land them from Canada, and not much harder to spread them throughout the country with Fairport as a distributing center. Enter Dr. Kaukonen, age twenty-three, youngest graduate of the Women's Medical College of Pennsylvania. Her medical work brought her into sad familiarity with the effects of bootleg whiskey, and she determined to banish it from Fairport. Her duties as Mayor included the appointing of a Chief of Police, a Board of Health, and a chemist. Realizing the importance of these offices in her anti-bootleg campaign, she appointed to all of them someone she could trust implicitly, namely, herself. So now she arrests bootleggers because she is Chief of Police; she analyses their product because she is an expert chemist; and she pronounces against them in her capacity as Board of Health. The bootlegging ring finds Fairport very difficult these days. With all this, Dr. Kaukonen has time to spare for the licensing of soft drink parlors, the conviction of gamblers, and the inspection of dance halls.

Mrs. Mary McFadden, eighty-year-old

Mayor of Magnetic Springs, Ohio, has started a bond-raising campaign for a larger town hall and better fire-fighting apparatus. She has also insisted that bootlegging and gambling be stopped, that pool places be closed or minors excluded from them, and that the curfew ordinance be enforced. Her third innovation is a characteristic and delightful human commentary—she has inaugurated a hot lunch as an inducement for a full council meeting.

Miss Stena Scorp, Mayor of Salina, Utah, has not been in office long enough to have definite accomplishments to her credit, but her program is interesting. She plans to abolish unnecessary laws, revise others, enforce those which remain, and, in addition, improve the recreational facilities for young people.

The other women who are "mayoring" American cities are: Mrs. Ida Sparks Clark, who is enforcing prohibition and carrying out policies of wise economy in Cokato, Minn.; Mrs. Mayme Ousley, who accepted the office of Mayor of St. James, Mo., only because it offered such opportunities for service to her city; Mrs. Mary Peterson, of Red Cloud, Neb.; Mrs. Ella Jacobsen, of Waterloo, Neb., whose name was written in by electors when her husband was a candidate; Miss Helen B. Coe, of Langley, Wash.; Mrs. W. H. Beall, of Brewton, Ga.; and Mrs. Estella Tripp, of Rochester, Ohio; and Mrs. Ethel Stoner, just elected Mayor of Cokeville, Wyo. Iowa has two women mayors, one in Randalia, and the other in Lehigh.

Physical and moral house-cleaning and housekeeping—these are the things women mayors are thinking about and are doing. Men think of roads and water and buildings and budgets in terms of engineering. Women translate them into terms of municipal housekeeping. A good housekeeper has well-built, orderly paths; her water-supply is clean, adequate, and conveniently piped; her house is well made, comfortable, and well kept; she spends and saves on a budget. She goes a step farther—and here is where housekeeping is broader than engineering. She is deeply interested in educating children. She knows how vitally important it is to have them surrounded with the right kind of environment. Therefore, she translates those abstractions into concrete terms, and enters the realm of moral housekeeping.

A Million-Dollar Firecracker

A Warning to Municipal Fire Prevention Bureaus

JUST as a reminder that the Fourth of July will soon be here again, we call your attention to the disaster which came to Marysville, Calif., last year as the result of a pre-Fourth celebration.

Shortly after 2 o'clock on the Saturday afternoon preceding the Fourth, two small boys were experimenting with some of their Fourth of July purchases behind a livery

their streams effective. Burning shingles and flaring leaves from the palm trees spread the blaze rapidly, and with such a handicap the firemen were almost helpless.

The burned district consisted of 12 blocks, a total of 78 buildings being destroyed at a loss of \$800,000. To fight this fire, four 2½-inch lines were laid from a 1,000-gallon American-LaFrance pumper, two lines



Property Removed from Burning Home
Remains of the Railroad Trestle

The Junior Pumper on Duty
A Steamer Doing Valiant Service

stable. One of them threw a lighted firecracker on the roof, and at once the tinder-dry shingles were afire. An alarm was immediately telephoned in, but by the time the department arrived a thirty-mile gale had fanned the wooden building into a furnace so hot that it was impossible for the firemen to get close enough to make

from a LaFrance Junior pump, and two lines from a steamer. The two gasoline pumpers worked at capacity for four and three hours, respectively, and were then returned to their quarters and placed in service. The steamer was kept in operation for 16 hours wetting down the ruins.

Pre-Fourth celebrations and careless use

of firecrackers and of fireworks on the evening of the Fourth have caused millions of dollars' worth of damage in years gone by. An adequate campaign should be started at once by local fire department officials to carry the message of warning to every

school and every home in each city. This should be followed by a newspaper campaign the latter part of June, in order to emphasize the lesson when it is most needed and place the city in the "No Fires from the Fourth" list.

An Electrolysis Investigation on a 36-Inch Steel Force Main

Clever Detective Work Locates Source of Power Leak on Akron Water-Main

THE recent investigation of the causes of electrolysis on the 36-inch steel force main leading from the Earlville pumping station to the reservoir in the city of Akron, a distance of about eleven miles, was covered in an interesting manner by Victor B. Philips, of Cleveland, Ohio, in his paper read before the New England Water Works Association. The map on page 547 shows this main, as well as the location of the electric railway tracks, substations, gas-mains, steam railroad tracks, and the principal city water-main connection into the force main. Rather serious corrosion of the main had been discovered immediately west of the town of Tallmadge and at no other place. It will be noted that this point is more than three miles from the nearest electric railway tracks. It is also at considerable distance from either of the large gas-mains that might possibly have been contributing factors.

The town of Tallmadge comprises only a few houses, and there is nothing in the town in the way of underground structures or electric currents that might have had some effect on the force main. In a word, the corrosion was found at perhaps the one point on the main where it might least have been expected. For these reasons it was not at all apparent at the outset that the corrosion was due to electric railway current, and it was necessary to consider carefully all possible causes other than railway stray current. The case is distinctly unique, and the questions considered and the procedure followed in diagnosing the cause of corrosion and providing for its correction are therefore of more than ordinary interest. In studying

the case, the following causes of corrosion were investigated:

- (a) Railway current
- (b) Soil corrosion
- (c) Small local galvanic currents

Railway Current

Preliminary tests upon the force main showed that current was flowing away from Akron in the direction of Tallmadge to the extent of about 20 amperes at the time of the railway peak load. It was also found that there was some slight flow of current from Kent toward Tallmadge, although this current frequently reversed direction. Potential readings were taken between the force mains and all metallic structures crossing it, namely, two gas-mains and several railroad crossings. These voltage drops were found to be small, about one volt or less, and apparently independent of the railway load and the magnitude of current on the main. It was therefore concluded that these structures had no bearing on the case.

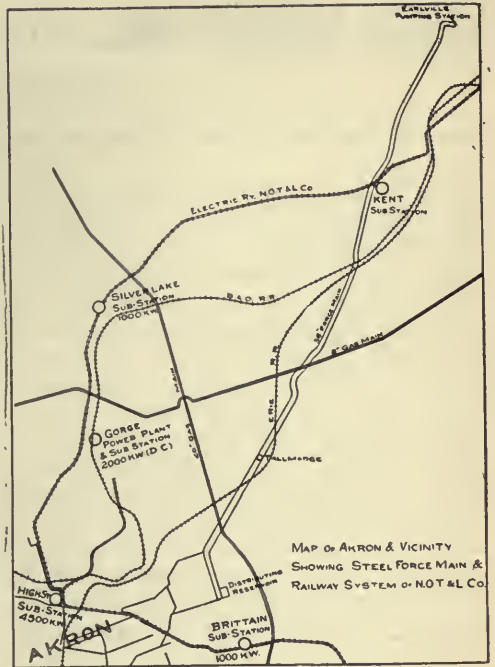
In order to determine the potentials causing the flow of current on the force main, voltage measurements were taken for 24 hours between the several railway substation negative busses and the force main at Tallmadge and at the Akron end. By means of these voltage readings it was possible to locate the point of minimum negative potential and thus to establish the path of the current. A study of these readings showed that the negative bus at the Gorge substation was the most negative point in the area under consideration. This served to indicate that the current which was apparently leaving the force main near Tallmadge was returning to the Gorge sub-

station. This fact, however, in itself could not be considered as conclusive evidence, inasmuch as it appeared unlikely that there was sufficient voltage difference to cause this current to flow directly across country for a distance of more than three miles.

In order to get a direct indication of the flow of current from the force main into the earth in the locality of the corrosion, a 24-hour record was taken of the millivolt drop between two non-polarizable electrodes buried in the ground about 18 inches apart and at right angles to the axis of the main, with one of the electrodes very close to, but not touching, the main. The characteristic peaks and valleys of the curves plotted from this record showing the voltage drop between the water-main at Tallmadge and the Gorge substation negative bus were regularly coincident, the only exception being between 1 A. M. and 2 A. M., when the High Street substation negative bus became temporarily the most negative point on the system. At this time the flow of current in the earth near the force main reversed, as might reasonably have been expected. This information showed quite conclusively that there was a flow of current off the force main in the Tallmadge area and that this flow was a function of the potential drop from the force main to the Gorge substation negative bus.

A study of the geology and topography of the country between Tallmadge and the Gorge substation disclosed the fact that there was an almost continuous low-resistance path, due to creek beds and wet ground. The current was simply following this path.

Having established the fact that there was a measurable flow of current off the force main in Tallmadge directly across country from the Gorge substation, it was then necessary to determine the reason for the current's taking this long, roundabout, and comparatively high-resistance path. At least one contributing cause was found to have been the rather long stretch of poorly bonded track between the High Street substation and the Gorge substation. Thus, a certain part of the power originating in the Gorge substation positive feeders had to find its way back to the Gorge substation negative bus by another path than the high-resistance rail circuit. This increment of current then followed the tracks of the railway sys-



tem into the High Street substation and thence through a bonded connection into the city water system and into the steel force main. It should be pointed out that the route followed by the railway, as well as the city of Akron force main, is all on high, well-drained and consequently dry ground, so that there were no low-resistance ground paths by which this current might have taken a shorter route to the Gorge substation.

With the above information, it became a simple matter to eliminate the flow of current on the force main. This was done by thoroughly bonding the tracks, especially in the locality mentioned above, and by running out a negative feeder from the Gorge substation in the direction of High Street. This feeder was not tied to the tracks for a distance of 3,000 feet, although the connection between the Gorge negative bus and the track at the substation was retained. In this way a part of the return circuit drop was transferred to the negative feeders, with the result that the potential of the tracks was raised considerably. These mitigative measures served two purposes, namely, to provide a metallic return circuit of high conductivity and to reduce the potential drop between the force main at Tallmadge and the Gorge substation.

High Lights on American Water Works Convention

Unusual Interest Shown in Papers and Exhibits by Large Number of Delegates

THE American Water Works Association held its annual convention in Philadelphia May 15-19, with headquarters at the Bellevue-Stratford Hotel. This convention will remain notable in the eyes of all who attended, because of the unusual interest manifested in all its activities. Although the meetings were not called to order at the times specified, they were very well attended and productive of much valuable discussion. Both during the sessions and at other times the exhibits of the water-works manufacturers were thronged with interested superintendents and engineers. The spirit of the delegates showed itself in close examination and inquiry rather than in the cursory glance which bespeaks lack of interest.

Notable among the papers of Tuesday, May 16, were very valuable discussions of fire prevention and fire protection in relation to public water-supplies, by Frank C. Jordan of the Indianapolis Water Company, and the extemporaneous address on the Hetch Hetchy water-supply, in place of M. M. O'Shaughnessy's paper. This talk gave unusual force to the contention that convention papers should be read in abstract, leaving the details for publication in the *Journal*. The paper, "Underground Leakage and Its Relation to Mains and Services," by Thomas F. Wolfe, Secretary, Cast Iron Pipe Publicity Bureau, read at the evening session which was arranged for by the Water Works Manufacturers Association, gave many interesting facts and figures on the value of cast iron mains as service lines. Mr. Wolfe decried the present system of listing leaks as so much per mile of main or per inch of joint without a statement as to whether it includes service line leaks or not. Experience has shown that most leaks occur in services.

In the Wednesday forenoon session, the paper, "Problems in the Reforestation of Watersheds," by George R. Taylor, Scranton, Pa., was particularly well received. The paper, as well as the lantern slides, proved very instructive and produced considerable discussion of reforestation.

In spite of the raw wind and rain, which chilled those on the upper deck of the boat provided by the Water Works Manufacturers Association for the Wednesday afternoon trip on the Delaware River, there was a large attendance. Great interest was shown in the various shipbuilding yards and the Chester water-works.

Superintendents' Day on Thursday brought out a number of papers of great value and an unusually large attendance of superintendents. The Chemical and Bacteriological Section thoroughly enjoyed its lengthy discussions of hydrogen ion concentration, but little of practical value to the plant chemist or the superintendent seemed to come out of the discussion.

The Executive Committee presented the names of three cities which had asked for the 1923 Convention of the American Water Works Association, namely, Detroit, Mich., San Francisco, Calif., and Omaha, Nebr. San Francisco withdrew from the race in favor of Detroit, asking, however, that it be remembered for the 1924 meeting. By an overwhelming majority, the delegates and manufacturers chose Detroit and its proffered hospitality for the 1923 Convention.

The following officers were elected: President, W. F. Kramer, Chief Engineer, Water Works Company, Lexington, Ky.; Vice-President, George W. Fuller, Consulting Engineer, New York City; Treasurer, William W. Brush, Deputy Chief Engineer, Department of Water Supply, Gas and Electricity, New York City; Trustee for District 1, George W. Batchelder, Water Commissioner, Worcester, Mass.; Trustee for District 4, Joseph W. Ellms, Consulting Engineer, Cleveland, Ohio.

The Water Works Manufacturers Association elected the following officers: President, Edgar J. Buttenheim, *The American City*; Vice-President, Charles R. Wood, R. D. Wood & Company, Philadelphia, Pa.; Secretary, John A. Kienle, Mathieson Alkali Works, Inc., New York City; Treasurer, Dennis O'Brien, A. P. Smith Manufacturing Company, East Orange, N. J.

Budget Making and the Citizens' Interest

By Lionel Weil

Chairman, Finance Committee, Goldsboro, N. C.

IN order that the various administrations of the cities and towns throughout the country may attain their fullest measure of success, three important factors are necessary—good men, good laws, and a continuing interest by the people.

The value of public interest is not only important, but, to a large extent, determines whether we shall have good men and good laws. An indifferent electorate invariably begets a mediocre administration. The best results have always come when the people are keenly aroused to a proper appreciation of our civic problems.

In the range of municipal problems, there is no event more important, nor one that should engage public attention to a greater degree, than a consideration of the budget.

What the Budget Is and What It Does

Simply stated, the city budget is the financial plan and guide for the yearly conduct of its business. It embodies the detailed estimate of expense and revenue necessary for the proper operation of its government, systematically arranged according to its various departments, with a comparative statement of the previous year's transactions. It enables the city to determine accurately its financial program and shape its policies a year in advance, thereby giving the public a deeper insight and a better understanding of what services are planned and what financial burdens they are expected to share.

Experience has shown, by thus planning ahead and taking into consideration the various requirements of each department according to its relative importance, that money has not only been saved, but that a higher standard of service has been secured. As a proper safeguard and good business, therefore, the budget becomes of equal importance to the small town and the larger city.

Who Should Prepare the Budget?

The first step necessary to the preparation of a successful budget is executive authority. In the city manager form of

government, this duty naturally falls on the city manager, assisted by the chief financial officer. In the commission form, and the federal plan of government, where the commission or the mayor appoints all department heads, who are directly responsible to the commission or the mayor, it should be their duty to secure the proper estimates from the various departments. In towns or cities where government by committees continues to flourish and such centralization does not exist, it is desirable that the mayor or the municipal executive call together the various representatives of the several departments, lay before them the city's current revenues, and ascertain what the requirements for their respective departments would be for the current year. Here, by a committee of the whole, the public need could be correlated and the absolute necessities approved.

The entire estimates, with supporting data, could thus be prepared for presentation to the board of aldermen or council. The preparation of the budget estimates, outside the council itself, and their final approval or disapproval would place the responsibility of government where it actually belongs.

Determining Relative Values

In the making of a budget, one of the real problems is to ascertain the relative amounts needed for the departments. Since the fundamental prerequisite to the existence of society in any form is the preservation of law and order and the protection of life and property, it would seem that the first care of the city would be adequate provision for public safety. This would include the work of the police, fire, and public health departments and they should therefore be the first to be put on an adequate basis. The necessary condition to accomplish this end would be the provision of such public improvements as the above—lighted streets, water and sewerage, and the machinery for fire-fighting.

After these elemental needs are taken care of, the undertaking of most conse-

quence is public education, since popular government is dependent for its continuance on an educated citizenship. In view of the fact that our city schools are taken care of, in most of our communities, by a separate and distinct corporation, this subject will not constitute part of the present discussion. In this connection, however, the support and encouragement of the municipality should be given to its public library.

Next in order come the numerous and various activities of social welfare, relief of the poor, places of recreation, and playground facilities.

Expenditures

It is a prevailing practice for a city to first estimate the essential expenditures for the year and then provide revenue for meeting them. The expenditures of the average municipality may be reasonably classified under the following departments: (1) Administration; (2) Police; (3) Fire; (4) Health and Sanitation; (5) Streets; (6) Sewerage; (7) Water; (8) Lighting; (9) Education—Schools and Library; (10) Parks and Playgrounds; (11) General Expense and Contingencies; (12) Sinking Fund and Interest.

In order that any change in the assets of the city may be properly reflected in its financial statement and that the actual operating expenses may be known, it is necessary to separate the expenditures of these various departments into two classifications, Expense and Capital Outlay. Expense comprises all items of expenditure necessarily incurred for current administration. Capital Outlay comprises expenditures of every character made from the general fund which increase the assets of the corporation, popularly called "permanent improvements."

Sources of Revenue

For clearness and convenience, revenue is divided into two classifications: (1) revenue for the general fund, which includes current revenue; and (2) revenue for the sinking fund, which includes revenue for interest and the payment of the principal of bonds at maturity. The principal sources of revenue for the general funds are the taxes on real estate and personal property, including poll taxes, special licenses and fees, water rentals, electric light receipts, and costs from the City Recorder's or Mayor's Court.

Appropriation Ordinance

In order to make effective the various proposals in the budget, an appropriation ordinance should be drafted and passed by the council. The budget then becomes operative as the administration's guide for the current year. To insure its effectiveness and to make it thoroughly binding, every contract for the purchase of supplies, material and equipment should become valid only when the city auditor or comptroller certifies that funds are available and the contract is signed by the chief executive officer under authority of the governing body. Further, no expenditures for salary and labor should be made by the chief executive officer until the city auditor certifies that funds are available. A monthly balance sheet should be presented to the council so that a proper check as to its operations can be had and, at all times, the unexpended balance may be shown in each department.

Some Basic Charter Provisions

A few of the more important provisions of the North Carolina Finance Act and the Model City Charter are submitted as a suggested guide for budget procedure:

The fiscal year of the city shall be from June 1 to May 31, or from September 1 to August 31, inclusive; and not earlier than one month before, nor later than one month after, the beginning of each fiscal year, the chief executive of the municipality shall prepare and submit to the council an annual budget for the ensuing fiscal year based upon detailed estimates furnished by the several departments and other divisions of the city government, according to a classification as nearly uniform as possible. The budget shall present the following information:

(a) An itemized statement of the appropriations recommended by the chief executive of the municipality for current expenses and for permanent improvements for each department and each division thereof for the ensuing fiscal year, with comparative statements, in parallel columns, of the appropriations and expenditures for the current and next preceding fiscal year, and the increases or decreases in the appropriations recommended.

(b) An itemized statement of the taxes required and of the estimated revenues of the city for all other sources for the ensuing fiscal year, with comparative statements, in parallel columns, of the taxes and other revenues for the current and next preceding fiscal year, and of the increases or decreases estimated or proposed.

(c) A statement of the financial condition of the municipality.

(d) A copy of the budget shall be filed in

the office of the city clerk for public inspection not later than ten days before its adoption by the governing body, and a public hearing shall be given thereon by the governing body before the adoption of the budget, notice of which hearing shall be published.

(c) Such other information as may be required by the city council. Such budgets, when adopted by the council, cannot be changed except at a regular meeting, and upon a two-thirds vote of the whole council.

The foregoing sections relating to budget procedure are in accordance with the best modern thought and practice on the subject, but no instrument, however well conceived and executed, can be thoroughly successful unless it is understood and approved by an enlightened public.

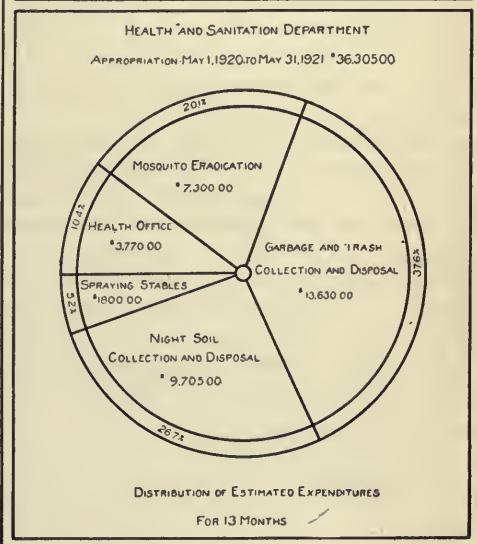
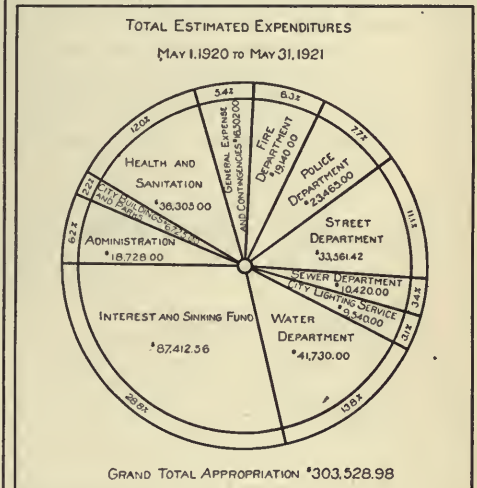
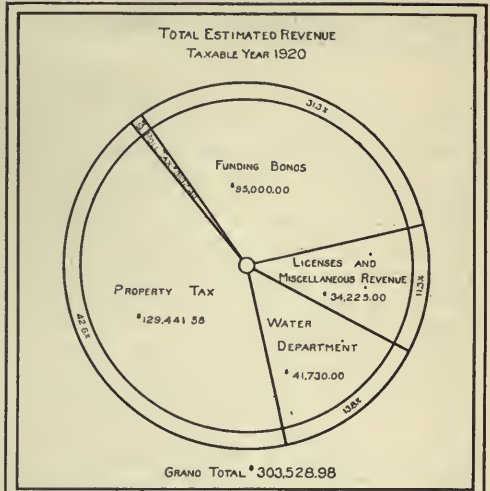
Reaching the Public

The budget can, and should, be one of the chief means of arousing public interest and extending public knowledge. Figures are cold facts to the majority of people—ordinarily, they are as dry as dust. Every legitimate effort, therefore, should be made to present the proposed appropriations, with their supporting data, so as to attract the average citizen by a joint appeal to his common sense and imagination, first gaining his understanding and then securing his confidence. Copies of the proposed budget should be printed in circular form and distributed. Subdivided circles, graphically showing the relative expenditures and the comparative percentages for each department, also sources of revenue, their amounts and the comparative percentages of these sources, will secure a greater clearness and better understanding.

The budget should also be printed in story form for the local newspapers, showing, by departments, what additional service can be accomplished by each appropriation. A suggested caption might be: "What It Costs to Run City Hall—Here Are the Figures to Show Just What Your Money Does."

The following items will serve as a helpful illustration—Under "Health and Sanitation":

"This year's budget contains \$10,000 increase for the eradication of the mosquito. It is confidently predicted that, with the disappearance of the mosquito, malaria will be arrested and the health and economic efficiency of 500 individuals will be restored, and that they will be returned to their usual avocations."



Under "Motorization of the Fire Department":

"The proposed purchase of a motor truck for \$6,500 not only improves the efficiency of our Fire Department in enabling it to extinguish fires in their incipency, but will secure 5 per cent reduction in our insurance rates, and in two years our citizens will save enough to offset the original cost of this truck!"

And, finally, under the headline, "Service vs. Cost," the following argument might be justified in any well-governed and rapidly developing municipality:

These various improvements have necessarily been added with an increase in the tax rate. But if one can in any way interpret the desire of the average citizen, we believe he would be unwilling to revert to the old condition, poor service and low taxes. A low tax rate, accompanied by very little resulting benefit, is seldom appreciated.

The following thought should illustrate this idea: The recollection of a low price for a cheap article is soon forgotten, but the poor service it has rendered is long remembered. Our conception of city government is rapidly

undergoing a change. In bygone years, the prevailing policy of some administrations has been to see how cheaply the government could be administered. The standard of living has so greatly changed that the luxuries of yesterday have become the necessities of to-day. So our people have come to give first consideration to the character of service and efficiency rendered rather than low-cost operations.

The budget, outlining the city's plan of action for the entire year, carries with it a most vital message. An earnest endeavor should therefore be made to secure the full-est publicity in its consideration. The public should be invited to participate in a full discussion of its provisions at a meeting of the council called for this purpose, to the end that when the budget is finally adopted the administration will have the sympathetic understanding and the harmonious cooperation of an interested citizenship.

ACKNOWLEDGMENT.—From "Attainable Standards in Municipal Programs," published by the University Extension Division, University of North Carolina, Chapel Hill, N. C., December 1, 1921.

The Child Labor Decision—What Are We Going to Do About It?

Seven Next Steps

(1) Our parents can secure state laws which require children to go to school regularly until they are 16; whoever is at school, of course, cannot be working in factories or even at home.

(2) School officers and business men can advertise so well that going to an efficient school pays better than even earning money, that parents will keep children at school wherever possible.

(3) Citizens everywhere can work for efficient schools.

(4) Boys and girls can often earn more by being careful of clothes and food than by going to work when too young.

(5) Your locality can be interested in providing scholarship or loan funds for those children whose parents are proved upon inquiry to be unable to get along without children's earnings.

(6) Teachers and editors can teach employers that premature child labor hurts them and reduces their profits in the long run; business will make bigger profits from high-paid workers than from low-paid workers; the fewer the child laborers, the more high-paid workers our country will have.

(7) Finally, every American school child can help remove such arguments for child labor as that children who do not stop school at 14 become lazy and thriftless.

Constitutional Amendment?

The executive council of the American Federation of Labor and others propose a Constitutional amendment which would abolish child labor.

—From the *Institute for Public Service Looseleaf Current Events No. 10.*

It is well understood by every intelligent citizen that a very large percentage of disease is preventable. The health of the children demands clean homes with sanitary surroundings.

—Public Health, State Department of Health, Lansing, Mich.

Fundamentals of Design for Safe Roads

By A. R. Hirst

State Highway Engineer, Madison, Wis.

IN securing safety on highways, probably the greatest advance can be made in the design of the highway structures themselves. Up to the present the principal idea of American highway engineers has been to build a structure which will stand up under traffic; very little attention has been paid to safety. Practice along safety lines, however, is making rapid advances as traffic becomes heavier and faster.

It has recently been stated that more accidents occur on straight highways than on curving and presumably dangerous highways. It is doubtful if this is true in general. If it is true, the trouble is probably caused by too narrow surfacing or by the presence of more traffic on the straight-away sections than on the sections with excessive curvature. In all probability, if the exact number of vehicles and accidents were known, the road with the greatest number of sharp curves would show the most accidents per mile of traffic. A comparison of accidents without a comparison of traffic is worthless.

Vertical curves are almost as dangerous as horizontal curves, especially if the surfaces are narrow and the drivers do not keep to the right side of the road on approaching the crown of hills. Vertical curves should have a radius of at least 1,000 feet. With this radius, an approaching vehicle can be seen 200 feet ahead and there is comparative safety if there is moderately careful driving.

No horizontal curves of less than 300-foot radius should be planned, unless the circumstances are very exceptional. On high-speed main lines of travel and on roads which carry the highest character of traffic, almost any expenditure is justified in order to secure such curves or even easier ones. A curve of 300-foot radius in a cut gives vision only 200 feet ahead—and this is little enough when it is considered that two cars going 30 miles an hour will meet in two seconds after seeing each other.

Superelevation and Widening

Curves should, of course, be superelevated and widened. This practice is now general in several states and, while in most cases it has not proceeded far enough, a greater number of radical superelevations are being used each year. It is believed that on curves less than 300 feet in radius, superelevations up to one inch to the foot are desirable. All curves of less than 1,000-foot radius should be widened, the widening becoming greater as the radius of the curve becomes smaller. If radii as small as 300 feet are used, the widening should be at least 24 feet on a two-way road.

Where it is impossible to get curves with a radius of 300 feet or more—if such a case exists—care should be taken to secure at least 200 feet of vision ahead. Too many engineers are placing their curves so as to restrict the vision, although it is possible by throwing the ends of the tangents away from the bank to put in the same curve and still get vision past the bank. Cutting down banks to the line of vision is being practiced to some extent, but unless good maintenance is secured, this is not proving as satisfactory as was expected, because of weed and brush growth.

Dead ends come under the same classification as curves. Dead ends are corners where the course of the main highway is not continued by an inferior highway, while the main highway makes the sharp turn. Treatment in such places should be just as radical as at curves, and added protection should be given by erecting white boarding across the dead end, so that the driver is notified that the highway turns sharply. On such boards an arrow indicating the direction of the turn is helpful.

The points of danger on our highways occur at curves and on high-speed main lines of traffic. Too much money cannot be spent in securing good vision by building curves of easy radius. The fact that in every case an easier curve shortens the center line distance and thus reduces the

amount of paving required, always helps to offset the additional cost of securing right of way for such curves.

Insufficient Width Is Dangerous

Next to curves, the factor which probably produces the greatest number of accidents is narrow surfacing. No permanent roadway should be built with a width less than 18 feet on any main line of travel. Twenty feet is much better and far safer. We do not believe in building over 20 feet wide unless a road for four lines of traffic is desired, in which case 36 feet should be the minimum and 40 feet would be much better.

Pavements on high-speed roads should be some multiple of 10 feet in width, providing a lane for each line of traffic. Such widths as 14, 15, 16, 24 and 32 feet, and any other widths that do not provide a clear width of at least 9 feet for each line of vehicles, are useless widths and should never be figured upon. Large sums of money have been wasted or partially wasted in building pavements of such width. If the traffic does not justify at least 18 feet, a 9- or 10-foot road should be built, so that no one will be deceived into believing that there is a double-track road where such does not exist. These roads can be made double-track later when funds become available. Wide pavements make for easier and

cheaper maintenance, in that they keep the traffic off the edges of the pavements, make for easier shoulder maintenance and also provide for a moderate distribution of traffic.

Bridges and culverts should be built of adequate width between end walls. The distance between end walls should be at least equal to the width of the top of the fills when new. It is suggested that on main lines of travel not less than 26 feet should be used as the distance between end walls or parapets of bridges and culverts, and if grades are wider, greater distance should be provided.

In the design of bridges and culverts, especially in the end walls and railings, there are great opportunities for the beautification of highways. Artistic paneling on spindles adds very materially to the appearance of concrete structures without greatly increasing their cost. People are usually willing to pay for the artistic, once they have a sufficient number of samples of artistic bridges from which to judge the effect of good proportion and good design.

There is need for some artistic development in the construction of guard-fences. Nothing, probably, adds more to the appearance of a highway than well-constructed, well-aligned, white guard-fences.

Fort Smith, Arkansas, Celebrates Opening of New Bridge

ON May 11 and 12 the new Free Bridge spanning the Arkansas River at Fort Smith, Ark., was opened with appropriate dedication ceremonies. The bridge, built of reinforced concrete, is 3,168 feet long and 38 feet wide with a 5-foot sidewalk on each side, and cost \$1,000,000.

The state line between Arkansas and Oklahoma crosses the bridge. It is a continuation of the main highway from Arkan-

sas into the state of Oklahoma. The bridge was built by an improvement district voted by the people. The bonded indebtedness of \$1,000,000 is to be redeemed within 25 years, the interest being payable semi-annually.

We are indebted to Hon. Fagan Bourland, Mayor, Fort Smith, Ark., for the photograph of the bridge and the information above.



THE NEW REINFORCED CONCRETE ARCH BRIDGE AT FORT SMITH, ARK.

The Need for Health Training in Our Schools

By George T. Palmer, Dr. P. H.
Epidemiologist, Detroit Department of Health

THE most valuable asset which a child takes with him on stepping forth from the public schools is a healthy body. Lacking this, the school pupil faces the world handicapped. It is true that some of these handicaps are so far humanly unpreventable. We are interested particularly in the ills that do not have to be.

A Community Health Program

The community can perform for the school pupil three distinct services that make for health. First, it can institute a system of daily nursing service in each school building, with the object of controlling contagion. Early symptoms of communicable disease are detected, and children thus affected are excluded before there is opportunity for exposing many others. Secondly, there should be complete inspection of pupils at least once a year for the purpose of revealing physical defects. With this knowledge, parents can take corrective steps before the condition becomes aggravated. Thirdly, the community, through its educational forces, can familiarize children with health history and with good personal hygiene and can arouse in the child a desire to establish good health habits. This program is dictated as a governmental responsibility, as a groundwork for a healthier commonwealth in the years to come, and as a business investment. The prevention of sickness and incapacitation means fewer charitable institutions, asylums, prisons and relief agencies.

The need for these health services is

illuminatingly shown by the experiences of any of our municipalities. It has not been uncommon to find at the beginning of school in September, children in advanced stages of acute infections—scarlet fever cases with skin beginning to peel, chickenpox and smallpox cases with pustular eruptions. These are mild cases which no physician has seen, but which are capable of causing severe illness in others. During the year 1921, school nurses of the Detroit Health Department found 15,000 cases of disease in the school and in the home. These

infections would have been passed on to many others had not the nurses brought them to the attention of the medical diagnosticians. A thousand cases of pediculosis (head lice) threatened the disruption of a high school one winter. The next year an inspection

It is well worth the trouble and expense to incorporate health education in the elementary, as well as the high school, curriculum. This information must come from the medical and nursing personnel of health departments, from the instructors in physical training, and from the school teachers. The already crowded school program should be adjusted or balanced to meet this situation, even at the expense of eliminating some of the most desirable, though less necessary, cultural studies.

at the beginning of the school year ruled out the few guilty ones, and this practice annually has prevented the repetition of such a condition.

We self-satisfied Americans received a jolt in 1917 when, to our astonishment, we read that Uncle Sam had to examine three drafted men in order to find one fit to bear arms. We can see physical defects in embryo by looking at our school children to-day. The examination of 13,000 first-grade children in the Detroit schools in 1922 shows the following departures from physical perfection:

*Per Cent of Children with the Following
Physical Defects*

Enlarged cervical glands.....	0.8
Enlarged thyroid	1.3
Defective vision	5.1
Impaired hearing	1.5

Mouth breathing	12.0
Enlarged or diseased tonsils.....	57.0
Skin diseases	1.6
Anemia	6.0
Defective teeth	22.0
Deformed palate	0.02
Abnormal heart signs	3.0
Abnormal chest signs	3.1
Orthopedic	0.9

Eighty per cent of this group had one or more defects. It should be noted that in the Detroit examinations only marked cases are listed as defects. Slight or doubtful defects are not included in the above table. For this reason the number of teeth defects seems small in comparison with the records of other cities. Slight pit cavities or unclean teeth without pronounced cavities are omitted from the tabulation. If these were included, our records would indicate that at least 80 per cent need dental attention. As a matter of fact, the physically perfect specimen is rare indeed. Probably not more than two out of a hundred are free from at least one imperfection in physical health.

The largest item in the table is abnormal tonsils, 57 per cent of first-grade children showing the defect. In many cases this condition may be temporary and will shortly correct itself. In other cases we find here the seat of frequent colds, malnourishment and general ill health. This condition warrants a more careful examination by a private or a clinic physician to discover the corrective procedure necessary. Mouth breathing is frequently associated with abnormal tonsils, and unless the condition is purely temporary, the removal of adenoids may be indicated. Anemia and defective vision affect 6 per cent and 5 per cent, respectively, of first-grade children. Obviously, these conditions demand more careful medical examination to determine their true seriousness. Left undiscovered or unattended, we have in our growing school population physical abnormalities which will handicap many children all their lives and even materially shorten the lives of some.

Definite Health Lessons

These facts are not so much a cause for alarm as for action. It should be the concern of health departments to devise ways and means to lessen the occurrence of health defects. This involves intensive study of their causes and means for their prevention and correction, and then popular education in the subject. The educational program must reach into the home to protect the child before he enters school. The school

itself can do tremendous good by reaching the home through the child and by preparing the child to take care of the next generation.

Through health education the school child must learn something of the history of disease: that diphtheria caused ten times as many deaths forty years ago as it does now; that it is possible to protect against diphtheria by immunization with toxin-antitoxin; that vaccination protects against smallpox, and that in the Western States, where vaccination is lax, there is one hundred times as much smallpox as in the Eastern States, where there are stringent vaccination rules; that drinking sewage-polluted water has caused thousands of unnecessary deaths from typhoid and that American cities now have one-fourth the number of deaths from this cause that they had in 1900, very largely because of filtration and sterilization of water-supplies.

The first grader is not too young to learn that he should not put his fingers into his mouth, that he should not swap lollipops, that coughing and sneezing should be done in a handkerchief rather than in someone's face, that he should not drink from a public cup or use a common towel.

There is the whole question of diet that must be put across in a way that will leave its imprint on the child's mind. Thousands of children are reared on coffee and pastry. Their acquaintance with milk and vegetables is scanty. Just question a roomful of pupils in your neighborhood if you doubt this.

Much of the spread of acute infectious diseases is due to failure of parents to observe the Golden Rule. When "other" people's children are running loose with whooping-cough and measles, it is shocking to Mr. and Mrs. A., who have children. But the shockingness is forgotten when Mr. and Mrs. A.'s children are affected, and it is so hard to keep the children indoors when the case is mild. If growing children appreciate the means by which disease is spread, when they become parents they will think and act with more intelligence.

In thirty years' time our American death rate has been halved. The motive for broader education in health, however, is not only a longer life, but—what is equally important—a more efficient and comfortable life freed from the distressing, the debilitating and the expensive handicap of unnecessary physical defects and disease.



The Municipal Swimming Pool in Johnstown

By H. Lee Wilson
City Engineer, Johnstown, Pa.

FOR many years the residents of Johnstown, Pa., were without one of the most enjoyable forms of recreation—outdoor bathing. Two rivers flow through the city, but their unsanitary condition makes them unsatisfactory for bathing except at points too far distant for convenience. During 1920 the Lorain Steel Company built a small concrete swimming pool on its property in Johnstown. This was so successful that the public demand impelled the construction of several small privately owned pools. As all these were far too small, the growing demand for adequate bathing facilities resulted last year in the construction of Johnstown's first municipal swimming pool.

In connection with extensive improvements which the School Board was making, the Recreation Commission found that a much-needed recreation center could be built on an irregular tract of land owned by the Board, without seriously interfering with the building plans. The swimming pool is part of this recreation center, and the property will be further developed with a baseball diamond, tennis courts and a playground.

The circular or oval type is particularly adapted to public pools. The shallow water space provided at the edge tends to reduce the overcrowding so common in public pools because more than 75 per cent of those bathing do not swim. A diving platform



THE JOHNSTOWN POOL, UNDER CONSTRUCTION

at the center gives open space for the swimmers, as only those who are able to swim can reach it. In Johnstown a survey of the character of the available ground indicated the advisability of an oval pool, and this design was adopted.

The Engineering Department took advantage of all the space and designed a pool 252 feet long and 165 feet wide. It has a capacity of 1,000,000 gallons and accommodates over 1,000 bathers at one time. The water depth at the center is 10 feet, gradually decreasing until at the edge it is only 15 inches. At a point 54 feet 6 inches from the edge there is a more precipitate increase in the depth, from 6 feet to 9 feet, giving ample depth for diving from the platform placed at the center. The floor is 6 inches thick, reinforced with steel wire mesh weighing 35 pounds to the 100 square feet. The side walls are 12 inches at the top and 18 inches at the bottom, providing a batter on the inside face to offset ice expansion when the water is allowed to freeze to afford skating. The reinforcement is continuous from floor to wall, and the walls are additionally reinforced by 1-inch steel rods placed vertically 6 inches apart, and by three 1-inch horizontal rods at both the inside and the outside faces. A 9-foot concrete sidewalk, 6 inches thick, was placed entirely around the pool. The walk slopes away from the pool, $\frac{1}{4}$ -inch to the foot, and this prevents surface filth from entering the pool. Bath-houses will be provided and are now being designed in connection with the other improvements.

The expansion joints were arranged so that a day's work would consist of entire slabs. They were therefore placed 32 feet 6 inches apart on the long arc and 46 feet on the short arc, converging toward the center. Joints were also placed at all breaks in the grade of the floor. The platform was designed of wood construction so that it might be removed in the winter to provide a clear way for ice skating. It is bolted to concrete foundations under the floor.

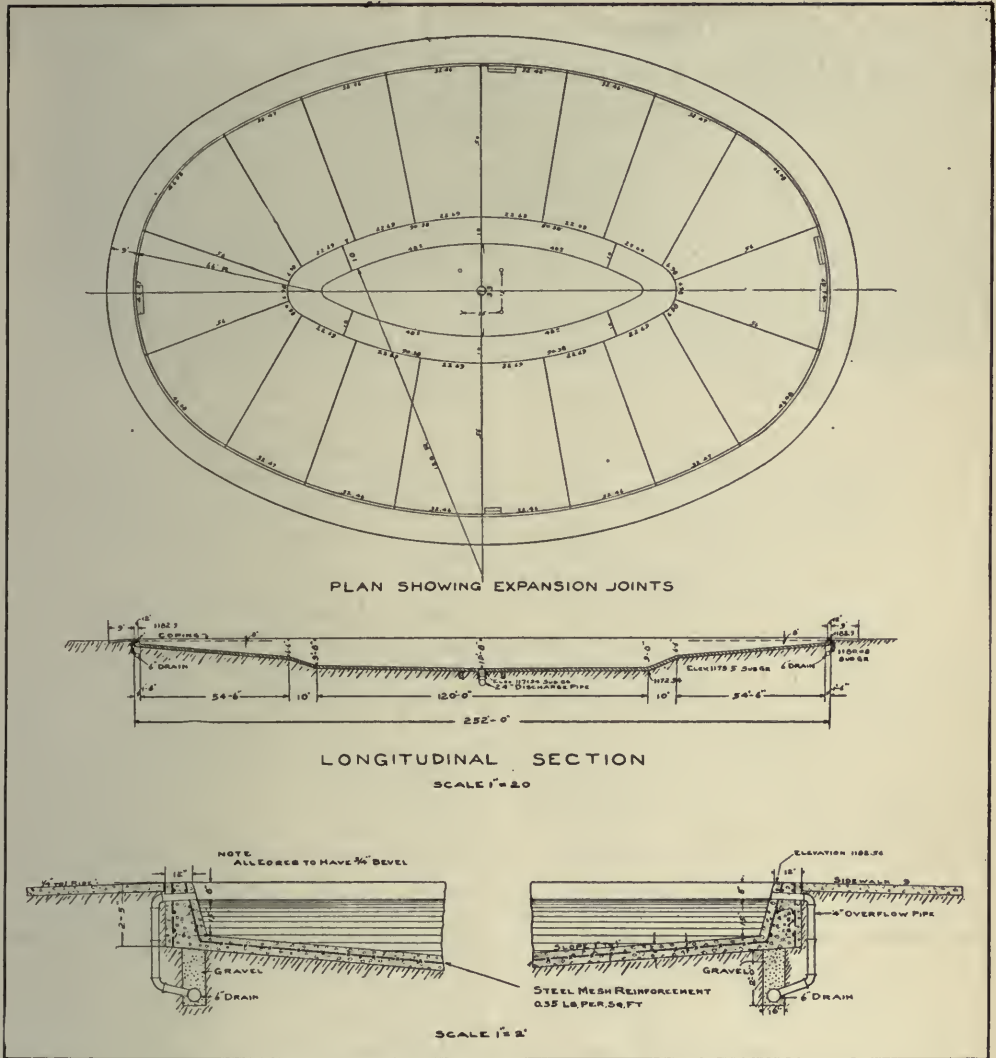
The wet, soggy condition of the subgrade necessitated extra care in providing drainage. A rather extensive system of sub-drains leads to a main drain placed lengthwise under the pool. The main drain in turn leads to an outlet under the center of the pool which carries the water to a 12-inch

sanitary sewer. A concrete sump prevents the overloading of this sewer, which is only a temporary connection. The permanent connection will be made as soon as the construction of the new 36-inch concrete storm sewer is completed. This drainage required 1,764 lineal feet of 6-inch and 8-inch drain tile laid in trenches 12 inches deep and 10 inches wide, filled with coarse broken stone. One 6-inch drain was placed under the outside wall, into which lead the four overflow pipes from the pool, thus maintaining continuous flow to keep the drainage system clear.

Two distinct sources of water-supply are available. The main supply will come from one 8-inch driven well which assures pure water. The pool is also connected to the city water-supply. In the event of a drought affecting the flow of the well in warm weather, when the pool is most needed, the city supply may be utilized. The design at first contemplated locating the water intake at the edge, but as this would not provide proper circulation, it was finally decided to supply the water at a point in the floor near the center of the pool, through an 8-inch cast iron pipe. The discharge is effected through a special grate in the floor at the center of the pool and through a 24-inch pipe line which empties into the sewer in the same manner as does the drainage system.

In the construction of the pool a 1:2:3 mix was used, with river sand as fine aggregate and blast-furnace slag as coarse aggregate. Slag was used, not because of its quality, but rather because an available supply was readily produced. The slabs were laid alternately. The extremely soggy condition of the subgrade under one of the slabs necessitated extra reinforcement. This was obtained by placing additional steel $\frac{1}{2}$ -inch rods 12 inches apart each way. The forms for the side walls were made in sections and used repeatedly. An interesting incident was the cooperation of the boys from the city vocational school, who built and placed the side walls for the concrete walk. The concreting operation was performed by having the concrete mixer set in an elevated position, the concrete placed in wheelbarrows with a long chute, and the wheelbarrows run along elevated boards to the desired location.

All expansion joints were specified to be



PLAN AND SECTIONS OF THE NEW JOHNSTOWN, PA., SWIMMING POOL

of 1/2-inch premolded Elastite joint material. Lack of joint material at the start of the work necessitated some other method of forming the joints. The wooden side forms of the slabs were left in place, and it was intended to remove them when the concrete had set and to pour the joint with asphalt. The great difficulty of removing the wood, however, made a very expensive method. All joints were sealed with asphalt at the completion of the work.

An average force of 23 men was required.

The summary of the final cost account is as follows:

700 tons of blast furnace slag, delivered.....	\$ 1,400
500 tons of river sand, delivered.....	1,700
1,000 barrels of cement, delivered.....	4,000
1,764 lineal feet of drain tile, delivered.....	352
184 lineal feet cast iron pipe and valve, delivered.....	1,700
12,000 pounds of steel reinforcing mesh, delivered.....	480
5,000 pounds of steel reinforcing rods, delivered.....	200
Rent on mixer, 60 days at \$10.....	600
Labor.....	11,500
Miscellaneous, expansion joints, form lumber, tools, etc.....	3,000

Total\$24,932

ACKNOWLEDGMENT.—Photographs by Ressler, Johnstown, Pa.

Some Conclusions from Recent Visits in Germany, Holland, Belgium, France and England

By Stephen Child

Fellow, American Society of Landscape Architects

AS outlined in *THE AMERICAN CITY* last month, the writer has recently had the privilege of visiting the countries enumerated above, with parties of trained city planning and housing experts, and has therefore had a particularly good opportunity to study their conditions. The question comes, how can these experiences help us in America?

From the point of view of the planning of towns (not the broader, all-inclusive subject of city planning), they cannot help us very greatly. Little is being done in any of these countries in regard to comprehensive replanning or rebuilding of the older portions of their cities, even the devastated cities, nothing at all comparable to what, for example, Chicago is accomplishing. (Rheims is a brilliant exception and the work of an American.) The making of town plans in most of these countries is confined to the preparation of what we should call new allotments on the outskirts of towns, and, as in most instances the topographical conditions are simple, the plan-problems are correspondingly so. Formality is appropriate, with straight lines of streets rather than curved. Diagonals are usually not forgotten. Narrow pavements are wisely used, few alleyways are employed, and frequent park spaces and open squares occur. The court or place has been quite generally overworked, especially

in England. Little or no attention is given to organized play and the providing of playgrounds. Front dooryards are generally not deep, 15 to 20 feet is the average, and rear yards are also for the most part comparatively shallow, seldom more than 50 or 75 feet in depth. Allotment gardens are not uncommon. Parks, as we know them, especially genuine, comprehensive park systems as in Boston, Chicago, Kansas City, and Portland, Ore., are almost unknown.

The great question of zoning has hardly been considered in either Belgium or France; and while it may be said to have originated in Germany, it is not being very actively considered even there at present. There is, however, an awakening in this regard in England. In all these countries, natural conservatism has served as a partial protection.

These countries, however, have much to teach us about housing, particularly housing for the poor. In every one of them a great deal is being done to help the poor man, not by building model tenements, but by housing him and his family in conditions that are usually excellent and occasionally luxurious. We are not doing this in America. We are building our Roland Parks, our Forest Hills Gardens and the like, but these are for what we should call the middle class, certainly not for the day laborer. And as to the various government war housing enterprises, this admittedly emergency effort was not only conducted under most abnormal conditions as to costs and speed, but was rightly directed largely to the better housing of the higher-paid skilled mechanic and foreman rather than of the really poor man. Is it not our problem here and now to do better for this enormous group? Must they always "continue to occupy the cast-off houses of the better paid?"

How are the Europeans doing it? First, by mass production. Projects of from 200



THERE ARE FEW DETACHED HOUSES, BUT MANY OPEN SQUARES. A GROUP AT DUSSELDORF



THE APPROACH TO MARGARETENHOHE, ESSEN, IS BY WAY OF THIS FINE STONE ARCHWAY CROSSING A VALLEY PARK

to 500 houses are quite common, and we noted one or more of 3,000. Then there are really very few detached houses, many semi-detached, and many more in rows or groups of from four to ten.

Eliminating Non-Essentials in Housing

As to details, an enormous amount of money is saved in the aggregate by the almost universal method of not building cellars. If there is any substructure, it is small; more often there is none, but a convenient outbuilding serves for coal, wood and supplies, at far less cost. Modern heating methods do not demand a cellar for genuine comfort in many parts of America, and we should do well to adopt some of the ingenious heating and cooking devices noted in England and Germany. These are being introduced in France, Holland and Belgium. Simpler methods of plumbing must be devised and our plumbing and building ordinances amended to permit them—they can still be safe, sanitary and healthful. For example, it should be noted that in the homes of the really poor it is not absolutely necessary to have porcelain bathtubs—often, as we know, abused. With other toilet and heating facilities, portable tubs or inexpensive shower-baths are perfectly proper. Among other things worth noting are: the comparatively small size of rooms, and the fact that they are often relatively low-studded; the common room or dining-room-kitchen, doing away with the extravagant parlor usually shut up except for funerals or weddings; and the small kitchenette, which saves money and steps. Standardized details, such as window-frames, doors, sashes, shutters, or blinds, and the produc-

tion of these in large quantities, contribute toward economy in construction.

As to exterior architecture, our American architects are by no means lacking in skill and taste; certainly Germany and Holland can teach them little.

The policy of buying land ahead, at or near agricultural values, and holding it for housing needs, is of the utmost importance, and there would seem to be no good reason why foreign principles in such matters should not be adapted to our conditions. The Society "Ons Limbourg" that buys the farm lands in the Maestricht mining district of Holland is run on principles that could be readily employed in America.* To be sure, it demands foresight, good judgment and a spirit of cooperation, but no American will admit that our people are lacking in these qualifications. The problem is to stir them up, set them to work.

The writer holds no brief for many of the foreign financial methods, however, certainly not for the private philanthropy of Port Sunlight and Essen with their over-luxurious provisions, nor the over-subsidization, the real government charity methods that have been so common in England, France, Holland and Belgium. He became fully convinced in 1920 when England's methods were at full cry that they were "riding for a fall," and the slump has now come, with disastrous results to housing and labor conditions. Holland did not go to quite such limits and is now proceeding more conservatively to retrench. Belgium is following closely in Holland's footsteps. Germany's methods of spend and make

* See THE AMERICAN CITY for February, 1922, page 103.



NO CELLARS—A CONVENIENT OUTBUILDING SERVES FOR STORAGE

Note small individual rear yards and the allotment garden area in foreground

debts and "the devil take the hindmost" certainly are to be avoided. On the whole, perhaps France is turning out to be the most conservative. Financial conditions have no doubt had much to do with this, and there to-day among the most thoughtful "it is hoped that private initiative will again get the upper hand when the people have been persuaded that the provision of small dwellings is a business proposition like any other, and that the capital which is involved therein ought to bring a net return at least equal to the legal rate of 5 per cent. The philanthropic societies which rent dwellings at lower than the market rent have killed private initiative."

And "there's the rub"—how not to kill private initiative, the faithful goose that will lay the real egg. Our Congress, state and city governments have been slow to act—and perhaps it is well. Our poor people, however, have had to double up and live in crowded, wretched conditions, but, except for the various war emergency housing efforts, now being liquidated, we have not piled up huge house-building liabilities.

Three Lines of Progress

Why should we not organize in America "Our Boston" and "Our San Francisco" societies to do as "Ons Limbourg" has done—buy housing lands, not for exorbitant profit, but for genuine, future building needs, then establish other coordinate groups, building societies, and so on, for the mass production of inexpensive homes? These societies would of course employ standardization for all it is worth—and it is

worth much. It is in these three items, the buying of cheap land, the mass production, and the standardization of parts, that they are making the greatest gains in Europe. Some of the methods have been alluded to. We must devise and establish similar methods suitable to our own conditions. Such organizations will then employ real economies for the poor man, will not permit him to waste his money on cellars, porcelain tubs, high ceilings, and stuffy parlors, but will so direct things that he will put his hard-earned dollars into what he needs—not tenements, but comfortable, attractive row houses.

To attract the working man's dollars, we must increase the scope of the splendid work done by the building and loan societies; for, in the opinion of those far better able to judge than the writer, our financial and building conditions would be infinitely worse to-day but for these organizations, and their usefulness must in some way be greatly increased. Some method must be devised, too, in regard to our savings banks, whereby the honest laboring-man-depositor—the man who is really saving to build his own home—may be assured by some sort of certificate that when he makes a deposit it will be used to buy cement, brick, lumber and nails and not be diverted by methods of high finance to other purposes. To really secure home ownership and help forward the "own your own home" campaign, the 100-monthly-payment idea of Germany and elsewhere may well be adopted by the mass production organizations above alluded to.

Mr. Hoover, through the Division of Construction and Housing, the Bureau of Standards, and the National Zoning Committee of the Department of Commerce, is doing a great work and should receive our support.

In order that these efforts of the Department of Commerce may bear the most fruit, is it not most important that the Division of Construction and Housing be permitted to organize in cooperation with the Library of Congress an American Centre of Civic Documentation to be affiliated with the International Union of Cities and its European Centre at Brussels—the project recently presented in *THE AMERICAN CITY*—the so-called "International Clearing-House of Civic Information"?

Forward Steps in Municipal Affairs

City Managers

City Manager Plan Makes Good in Bluefield

BLUEFIELD, W. VA.—Last spring a strong agitation arose in Bluefield for a substitute for the old mayor-and-council type of government, which, in the minds of many people, had too long paid political debts out of the city treasury. As a result, a new charter was drafted by a committee of one hundred, providing for the modern commission-manager type of government. Five directors or commissioners were provided for, they in turn to appoint the city manager. The new charter became effective August 1, and Clarence E. Ridley, formerly City Engineer and Superintendent of the Water-Works Department of Port Arthur, Tex., was selected as Manager.

Among the first things accomplished by the new government was a change from the slipshod method of purchasing and disbursing, to an up-to-date and systematic plan which furnished a definite and accurate control. A part-time health officer gave way to one on full time. A city physician, a sanitary inspector, public health nurses, and a bacteriologist were appointed, and for the first time the people of the city felt that their health was adequately safeguarded. A capable engineering staff was provided to care for public works. The salaries of the chiefs of the fire and police department and of the underpaid men under them were increased, and they were told to "produce results." The outcome has been a decided decrease in crime and lawlessness and in the number of fires. Back taxes, old assessments, and uniform collection of licenses were met in order, and because of the collection of these arrears and strict economy in the expenditure

of the city's revenue, additional services in all departments have been made possible, especially in the health department; a substantial sum has been set aside to redeem the bonded debt, something that had never been done before; a floating debt of \$25,000 has been paid, and \$35,000 has been set aside to defray the city's share of permanent improvements. For the first seven months of the new administration, the operating cost was \$20,000 less than the budget estimates which were prepared by the old administration, based on the average operating costs under the mayor-and-council plan.

During the coming year, the city expects to be able to provide a considerable amount to apply on the bonded debt. It expects to appropriate at least \$20,000 for the city's share in permanent improvements, and to set aside \$10,000 for the making of a topographic survey and the preparation of a city plan. It plans to make provision for the free collection and disposal of municipal waste and to do all this without increasing the present tax rate of \$1 on \$100 valuation, even though this is based on an assessment of approximately one-third of the actual value. Notwithstanding the low tax rate, the city is now being entirely financed on the pay-as-you-go policy.

CLARENCE E. RIDLEY,
City Manager.

City Engineers

Pontiac Tries Oversize Street Signs

PONTIAC, MICH.—Some months ago, when installation of street signs in this city came under discussion, our daily paper, the *Pontiac Daily Press*, suggested that a large street sign be placed at one of the principal corners of the city. This street sign was to be of such size that the motorist could see

it a half-block away, allowing him plenty of time to make the turn. As we have a tremendous amount of foreign traffic which may take any one of seven main trunk roads leading out of the city, it is very important that the transient motorist be helped as much as possible, so as to avoid traffic congestion.



FOUR-FOOT
STREET SIGN,
PONTIAC, MICH.

Accordingly, the large sign shown in the accompanying illustration was erected on one of the principal corners of the city. This has been in place some six months and has caused very favorable comment. There is noticeably less traffic confusion than in previous years, despite an increased amount of travel.

The sign was made by the local iron works at a cost of \$23. It consists of a 3-inch cast iron post 14 feet 6 inches long, on which are mounted two 10 by 48-inch plates of 10-gage material. The post is buried 3 feet in the ground and set in concrete, leaving 11 feet 6 inches clear to the bottom of the sign. The background is black, with white lettering 6 inches in height.

It is planned to place these signs on nine of the principal intersections and to place street signs of ordinary size on the principal streets. An appropriation of \$4,000 has just been made for this purpose and, while this will not cover the entire city, all the principal streets will be marked.

L. G. LENHARDT,
City Engineer.

Departments of Education

The Opportunity School in Columbus, Ohio

COLUMBUS, OHIO.—Five years ago a teacher in one of the grade schools in Columbus persuaded the Board of Education to allow her to conduct a special room for children who were not normal in ability and

therefore could not be taught properly in the regular classes. From this beginning has grown the Opportunity School, which is now housed in seven buildings.

Half of each day in this school is spent in regular school studies—reading, writing, arithmetic, language, spelling, geography, history. The other half of the day is spent in the manual training shop, or in one of the cottages, doing reed work, caning chairs, cooking, sewing, painting, and a variety of other manual work. The emphasis in this school is upon the hand work.

The output of the shop is indeed surprising. Bookshelves, tables, desks, and renovated chairs have been added to the equipment of the school. Old furniture of rare antique type, found in second-hand shops and bought for a small sum, is repaired, refinished, and sold. The wooden toy depart-



BOYS OF THE OPPORTUNITY SCHOOL CANING
CLASS

ment is a revelation. There are dolls of all sorts and sizes, fully equipped with clothes and with furnished houses. There are baskets, trays, embroidered articles, dresses, millinery, jellies, jams, canned vegetables, all made or prepared by the children in school. The salesroom is a veritable gift shop, and with prices more moderate than are found in the usual down-town shop. The boys and girls are thus supplied with really useful work, and at the same time the proceeds help to maintain the school.

The children come from all parts of the city, with car-fare provided by the Board of Education. About half of them had proved to be so backward mentally that they were a handicap in regular classes. The rest are those who have been sent there by order of the Juvenile Court for a variety of offences. Many of these court cases, or in-

corrigibles, are also sub-normal in mental ability.

The aims of the school are implied in its name—Opportunity School. It is a school where the children who are not able to keep up with the regular school-room classes and yet who have the ability to profit by special training, are taught simple occupations whereby they are able to earn their living. Many of these children, who otherwise would be permanent burdens upon society, become self-supporting. For the court cases, it affords a place where children can receive school training and vocational training, and still be under court supervision.

The grounds and buildings were bought by the Board of Education, and the cost of up-keep and the teachers' salaries are paid by the Board. In all else the school is self-supporting.

B. H. EISENBEIS,
Principal, Opportunity School.

City Planning Commissions

A Comprehensive City Plan for Richmond, Calif.

RICHMOND, CALIF.—At a meeting of the City Planning Commission of Richmond on October 14, 1921, a comprehensive City Plan, prepared by Carol Aronovici and Guy Wilfrid Hayler, associated city planners, was presented for the consideration of the Commission. The Plan, which was undertaken at the request of the City Council, has been some months in course of preparation and is based on an exhaustive civic survey.

The work has comprised studies of existing conditions, improved streets, major thoroughfares and transportation facilities, public utilities, distribution of population, water-front and harbor, and land values. The Plan provides a system of major thoroughfares linking Richmond with the surrounding territory and giving direct ac-



AIRPLANE VIEW OF RICHMOND, CALIF.

cess to the new inner harbor being constructed by the U. S. Government, as well as to the future development on San Pablo Bay. A boulevard system is shown, with a scenic boulevard on the shores of San Francisco Bay and a linking up of a series of city playgrounds and open spaces. An aquatic park is also contemplated in the region of swamp lands at Point Richmond.

Considerable attention has been given to the industrial and traffic development of the city, and a new neutral freight right of way connecting the Southern Pacific Railway and the Atchison, Topeka and Santa Fé Railroad is proposed. This will give the harbor and adjacent industrial locations excellent opportunity for shipment over trans-continental lines. In this connection the municipal wharf facilities are utilized to their full extent. The industrial locations on the harbor are to be served by new street car routing as well as trans-bay ferry services. The existing school playgrounds are to be extended in many cases, and provision is made for a future high school and stadium. In the northern part of the city a large public park is proposed.

A zoning scheme was also submitted in connection with the plan, making zones for residential property, business, light industry and heavy industry, with an unclassified area on the mountainous backbone of Point Richmond. The vexed question of apartment houses and multiple dwellings in the residential area is to be solved by local option, the adjacent residents determining the use of the land. The City Plan provides sites for a new public library, a hos-

pital, a police and fire hall, a post office, etc., together with the grouping of the present city hall with projected city buildings so as to form a central city garden plaza.

With a few suggestions for extending open spaces still further, the Commission accepted the plans. In a series of meetings the Commission went over each phase of the work in detail, and several citizens' meetings were also held to discuss local problems. On January 26, 1922, the City Planning Commission formally approved the Plan by unanimous vote. The City Council has since approached the question of adopting ordinances covering zoning, setback lines, etc., as well as propositions covering the larger schemes of civic improvement. An interesting feature of the publicity campaign for the Plan has been a series of special articles in the newspapers, in which the various problems have been analyzed. The Plan has been thoroughly dissected, and a further number of graphic diagrams have been compiled from the original plans, so that the ordinary citizen may be able to judge of the merits of the proposals without technical language or unfamiliar map illustration. In order that the fullest popular consent may be given, the Commission proposes that in the near future the citizens shall vote on its adoption.

GEO. B. FREDENBURG,
President, City Planning Commission.

Fire Departments

Fire Department Conducts Essay Contest

NEW YORK, N. Y.—A large number of fires occur in apartments, tenements and dwellings, over which the Fire Department of New York has practically no jurisdiction as to the enforcement of fire prevention methods. In order to bring about better cooperation between school children and the Fire Department, and through education to overcome the hazardous conditions in apartments and tenements, the Department has recently inaugurated an essay contest on fire prevention among the school children of the city.

In the schools of New York there are now about a million children, comprising one-sixth of the population. They are impressionable and afford a good field for education on the subject of fire prevention. By starting with the pupils in the fifth grade, it will be possible to give several years' training to each child before he or she leaves school.

In this way it is hoped to greatly reduce the number of fires that occur through ignorance or lack of thought. There is no question that the benefit of such training in the future will be enormous, and the Department is therefore supplementing its present-day fire prevention work by planning the careful education of the citizens of to-morrow.

THOMAS J. DRENNAN,
Fire Commissioner.

Public Welfare Departments

Service-at-Cost Succeeds in Toledo

TOLEDO, OHIO.—A reduction of about 12 cents per car-mile in operating expenses is shown as one of the results of Toledo's 11 months' experience under the "service-at-cost" ordinance by which the city traction lines are operated. The first annual report, including the first 11 months since February, 1921, when the ordinance went into effect, has been issued.

In February, 1921, the operating expenses were 42.863 cents a car-mile, and in December they reached the low point of 30.498 cents a car-mile. On the other hand, passenger revenues have climbed from 38.045 cents a car-mile in July, 1921, to 46.354 cents a car-mile in December, and 45.407 cents a car-mile in February, 1922.

By February 1, 1922, the city's equity in the Community Traction Company was about \$212,500, which represented 2½ per cent of the capital value of \$8,500,000. The ordinance provides that yearly this percentage of the capital value shall be turned over to the sinking fund until this amount equals 20 per cent of the capital value, when the payments shall stop for the time being. In 11 months \$476,749 was paid out in interest and dividends.

The Street Car Commissioner has had

the difficult position of striving to operate the traction system with the utmost efficiency and economy and yet to meet as far as possible demands for service on the part of residents along the car lines, strenuously made on their behalf through their councilmen.

We are bending every effort to build up the fare stabilizing fund to \$400,000, at which time the present 7 cents and 1 cent transfer fare rate may be lowered. This fund now aggregates \$86,412.

W. E. CANN,
Street Car Commissioner.

Municipal Vacation Camps That Work the Year Round

LOS ANGELES, CALIF.—The Los Angeles municipal camps—Camp Radford and Camp Seeley, in the San Bernardino Mountains—have just opened for their tenth season. Visitors to the camp in 1921 exceeded 4,000.

“These camps are the only ones where the main object is to accommodate people without regard for the dollar,” is the observation of a Government agent who investigated the system prior to establishing others in the governmental reserves, on a similar plan.

The Los Angeles Playground Department was the first to undertake a camp system outside of the city. Its charges are so low that vacation seekers pay but \$14.25 for two weeks’ holiday, and only \$7 for the children. Expenses can be cut, as each



CAMP RADFORD GIRLS ENJOY A TUG-OF-WAR

camper gives an hour of his time each day to camp duties—washing dishes, cutting wood, building bonfires, etc. Yet the rates charged cover the entire expense of maintaining the camps, the salaries of playground experts in charge, the wages of cooks and helpers, and the cost of clerical assistance and advertising, with a slight gain besides, accruing to the city, which seeks to give it back in service.

Over \$30,000 has been spent on the camps and central lodges. One camper expressed his appreciation of the city’s wise expenditure by saying that it was a positive pleasure to pay taxes when he found out what could be gained in pure enjoyment. Many who have hitherto been unable to afford holidays find it is no more expensive to go to the Los Angeles camps than it is to stay at home.

While whole families attend summer camp, certain outings are arranged just for boys, and others just for girls and women. The success of the camps is demonstrated, not only by the numbers, but by the reunions of camping parties held in the playground centers of the city in the winter time.

C. B. RAITT,
Superintendent, Playground
Department.



WINTER OUTING OF THE SIERRA CLUB AT CAMP SEELEY

Highway Departments

Using the Old Hitching-Post

SOMERVILLE, MASS. — In establishing traffic guides in Somerville, we have made use of the old-fashioned horse's-head hitching-posts as tops for the silent policemen. Hitching-posts were quite common



SHADES OF OLD DOBBIN GUARD TRAFFIC ON THE STREETS OF SOMERVILLE, MASS.

in front of residences throughout New England in years past, but with the advent of the automobile they have gradually disappeared. Having secured a number of these, we have set them on concrete bases, as illustrated, and are using them as silent policemen at the various street corners.

The post proper bears the name of the square or street, and on the base is painted the warning, "Keep to the Right." In addition to being more ornamental than the wooden sign, these posts are firmer, as each one weighs about 500 pounds. Quite a number of the wooden signs have been broken, but no damage has been done to the iron ones.

The only expense connected with the use

of the hitching-post was for the labor of removing it from the sidewalk, the construction of the base, the painting, and the placing of the warning sign on the street—probably about \$25.

ASA B. PRICHARD,
Street Commissioner.

Police Departments

Traffic Booths Lessen Accidents

KNOXVILLE, TENN.—The concrete traffic booths shown in the accompanying illustration were erected in Knoxville about a year ago. They are erected in the center of the street and are sufficiently strong to endure the impact of an automobile or other vehicle. The signals are operated electrically. Since the installation of these booths, accidents have decreased so noticeably that automobile accident insurance has been reduced 33 1/3 per cent. Thirteen booths have been installed at a cost of \$1,000 per booth. The city regards the system as so satisfactory that it is now contemplating the installation of four additional booths.

EDWARD M. HAYNES,
Chief of Police, Knoxville, Tenn.



CONCRETE TRAFFIC BOOTHS DECREASE ACCIDENTS IN KNOXVILLE, TENN.

The Business of Water-Works Management—Part II

By George A. Johnson
Consulting Engineer, New York City

Classes of Service

THERE are four main classes of water service: for public building and charity; for fire department and public works hydrants; industrial service; domestic service. In many cities the first two classes of service return no revenue to the municipally owned water department, its only revenue coming from strictly industrial and domestic service.

There appears to be no reason why every municipally owned water-works system should not be run on a strictly business basis, and for every measurable drop of water in whatever service rendered, a money return should be made to cover the cost. There is no reason why water consumed in public buildings, by the fire department, or at public works hydrants should not be paid for out of the general city funds. The taxpayer has to foot the bill ultimately, and it makes for much better bookkeeping and management if every city department is required to stand on its own bottom. The same idea applies equally well to reimbursement for water supplied to charitable institutions.

It is often the case that no charge is made for the large volumes of water used from public works hydrants for street sprinkling, street cleaning, and sewer flushing purposes, nor for fire extinguishing. Measurement of such use of water is little attempted; indeed, in some cities the water department

has no control over water consumption at such points.

In the eight large cities referred to in the table, leakage and waste (water unaccounted for) ranges from 10 to 34 per cent and averages about 17 per cent of the total water consumption, and municipal use of water ranges from 3 to 21 per cent, averaging about 8 per cent. The domestic and industrial uses of water are about equal in these cities respectively, amounting to about 37 per cent of the total consumption in each case. The average figures herein given closely approximate average conditions in all American cities.

In some cities, as has already been pointed out, of all the service rendered, an average of only about 75 per cent of the water actually pumped is revenue-producing. In Kansas City the case is particularly accentuated. There no revenue is derived from 35 per cent of the total water pumped. Obviously, in all cases the unnecessary waste must be cut to a minimum, and a campaign to that end is being vigorously prosecuted in Kansas City. Also, the endeavor is being made to restrict to a more reasonable figure the use of water for sewer flushing and street sprinkling.

Naturally, the 35 per cent of total water pumped without subsequent revenue must correspondingly increase the charges for the 65 per cent of water pumped from which all of the revenue of the water department

CLASSIFICATION OF WATER CONSUMPTION IN VARIOUS AMERICAN CITIES*

SERVICE	Toledo	Milwaukee	Cincinnati	Chicago	Boston	Cleveland	Newark	Kansas	
	1918	1919	1916	1916	1892	1904	1918	City 1919	
Domestic use	{ G. C. D..	40.0	40.5	45.0	45.0	30.0	26.0	34.0	40.0
	{ %.....	42.0	34.5	35.0	38.0	31.5	27.0	29.0	29.0
Industrial and commercial use	{ G. C. D..	40.0	45.8	47.4	50.0	30.0	40.0	44.0	49.5
	{ %.....	42.0	39.0	36.0	42.5	31.5	42.0	37.5	35.9
Municipal use	{ G. C. D..	5.0	13.0	23.0	7.0	3.0	10.0	3.0	27.7
	{ %.....	5.0	11.9	17.5	6.0	3.0	10.0	2.5	21.1
Under registration of meters	{ G. C. D..	2.5	3.0	3.4	.....	.....	.....	.....	2.1
	{ %.....	2.5	2.5	2.5	.....	.....	.....	.....	1.5
Leakage and waste	{ G. C. D..	10.0	15.0	13.2	17.0	32.0	20.0	37.0	18.4
	{ %.....	10.5	13.0	10.0	14.5	34.0	21.0	31.0	13.5
Total consumption, gallons per capita daily	95.0	117.3	132.0	119.0	95.0	96.0	118.0	137.7	

* Report on the water-supply of Kansas City., Mo., by Fuller & McClintock, 1920.

is derived. There is something very un-businesslike in this procedure. Unavoidable waste of water cannot be included in the equation, but all other water service, whether for domestic, industrial, charitable or public uses, should be charged for on an equitable basis and actually collected; and the amounts collected annually should, in the sum total at least, equal all overhead operation and maintenance costs, and in addition provide an annual sum sufficient in the aggregate to defray future replacements, extensions and improvements. The dates on which such improvements will be needed are capable of prediction with a degree of accuracy sufficient to make the idea an entirely workable one. In this manner there will be avoided the necessity of special tax levies, borrowing from other city funds to meet deficits in the water department, and eternal geeing and hawing of rates in an attempt to avoid the contingencies that must be the natural heritage of such unbalanced and inexcusable business management, and there will be an end of many new bond issues, the approval of which the body politic is called upon to give on relatively short notice. On such occasions there always occurs a division of opinion as to the necessity or desirability of the issue, which in consequence is just as liable to fail as it is to pass, regardless of the actual merits of the movement.

With the water department operating as a business enterprise, it is only necessary for the taxpayers to see that the administrative and operating staff are selected solely because of their competence and are in no wise indebted to political contrivance and favoritism for the positions which they hold. Their annual reports will constitute the accounts of their stewardship, and by them they will be judged. Make a business of the water department activities, run it like a business, and the community will profit by better service and lower charges for it.

Adjustment of Rates for Different Classes of Water Service

A competent survey of existing conditions should determine: first, what is needed to organize the administrative, operating and maintenance staffs on the best possible basis in the light of efficient and economical management of the water department; and,

second, what are the precise physical conditions and needs of all parts of the system at present, and the probable needs for a generation to come, all in the light of the ability of the system to render satisfactory service. From this information a budget can be prepared which will cover the estimated requirements for a term of, say, 20 years. The annual budget totals for this period will then serve as bases upon which to compute the charges for various classes of service, the receipts from all of which will equal or moderately exceed each annual budget as it becomes operative.

We now arrive at the proposition of how the necessary annual revenue may be raised by even and just distribution of the charge, to the end that the cost of supplying water year in and year out may be distributed over all classes of consumers as equitably as such things can be done in this world of imperfection.

The minimum rate.—In fixing rate schedules, experience indicates the apparent necessity of establishing a minimum rate payable by each individual connected to the distribution system, regardless of whether he uses any water or not. The reasons for this are: first, that every service connection represents a certain part of the total investment cost of the system, and accordingly should bear its share of the total cost of operation and maintenance; second, it is desirable that every citizen use a certain minimum amount of water daily for sanitary reasons; and third, the minimum rate is necessary because any consumer using less than the minimum volume fixed, if assessed on any other basis, would not return a revenue sufficiently great to pay for the maintenance of that service, and it would be continued at an actual loss, which would become an added charge on other consumers using more water.

Allen Hazen ("Meter Rates for Water Works," 1917, page 75) found that the amount of water furnished for the minimum rate varied from 40 to 300 gallons and averaged 120 gallons per day. These figures are equal to 8, 60 and 24 gallons per capita daily, respectively, assuming families of five. A better way of fixing the average daily volume of water allowed at the minimum rate would seem to be to fix on a definite quantity per capita for each actual inhabitant of the premises served. This would

tend to obviate difficulties such as those encountered in tenement houses. Hazen states that while the minimum rate might be applied to a fixed quantity of 20 gallons or so per capita for every man, woman and child living in every house, there is no assurance that each person or family in a tenement house would get its share. He suggests a provision whereby each tenement would be provided with certain fixtures for the free use of tenants.

Such matters as these—and they are important, too—are not susceptible of arbitrary rulings. Rather are they best settled in each case with reference to the local peculiarities of the problem. But if, as is sometimes the case, half of the domestic consumers pay for water service on the minimum rate basis since they use less water than that allowed at that rate, it is apparent that unless this minimum rate is high enough, the revenue derivable from such sources is not commensurate with the cost of producing that service. There are many cases where under the minimum rate scale the charge for 20 gallons daily is quite as high as that for 100 gallons. Quite patently it costs more under equal conditions to deliver 100 gallons than 20 gallons, but the facilities are there for producing the higher quantity and they must be paid for. This may be inequitable, but there seems to be no workable manner in which to avoid placing upon the user of 100 gallons per day or less, a part of the financial burden which properly belongs to the users of the larger volumes.

The adoption of a uniform rate of so much per gallon would be manifestly inequitable, inasmuch as it would raise the charge to manufacturers who use large volumes of water far above the figure which would be fair to them. As Mr. Hazen points out, this can only mean that the large users of water would then be made to stand the brunt of the deficiency in income which results from supplying small users at less than the actual cost. To do this would place in hazard the business of supplying the large users, for they might be driven to the development of an independent supply and thus a large share of the revenue on which the municipal water-works depend for their support would be summarily wiped out, leaving the community with the same fixed charges on its water-works investment and

approximately the same operating and maintenance charges. Such a predicament would be extremely disastrous in some cases, and very annoying in any event.

Fire hydrant rentals.—A community should pay fire hydrant rentals and collect taxes from the water department just as it does from other properties. The rental charge should be based upon the fixed charge on the investment for hydrants plus repair and replacement charges. There should also be a service charge representing the additional expense to which the water department has gone to provide standby service at times of fire, that is, readiness to serve water for fire extinguishing purposes in adequate volume over and above the normal peak load consumption. This charge ramifies into all parts of the physical plant, being reflected in the capacity of the pumping station equipment, reservoirs, mains, operation and maintenance costs, etc. From the sum total of these costs the fire hydrant rental can be computed fairly.

Public use of water.—There is every good reason why a fair charge should be made and collected by the water department for water used in public buildings, public schools and charitable institutions, and for all water used for street sprinkling and sewer flushing. This charge should be based on the volume of water so used, and the rate should be the same as that properly applicable to large domestic or industrial consumers.

A Business Basis Essential

There is not the slightest question that municipally owned and operated water-works systems can learn much from the experience of privately owned works of a similar nature. The latter are operated on a business basis, whereas the managers of the former, in all too many cases, are hampered in numerous ways when attempting to do likewise. The average taxpayer cannot be expected to rate as a business man of the first class—or a water-works man, either; still, he has a vote, and, what is even more important, a voice, and when campaigns are going on for a water-works bond issue he can be depended upon to use it for what he thinks is right, but which may be, and often is, utterly wrong.

Those in charge of municipally owned water-works systems should be aided in

every way possible in systematizing their work and reducing it to a strictly business-like basis. Their revenues must equal their production costs, else maintenance work, extensions and general improvements in the system will lag behind, to be accompanied by poor service and high costs therefor. Last year the July 2nd number of *Investment News* contained a pertinent paragraph along this line:

"Knowing that rate advances would be unpopular with consumers, they deferred acting upon such increases until big losses were being shown and revenues far from met operating costs. With the municipalities it became either necessary to make their utilities pay for cost

of operation or assess the losses upon the public in the shape of additional taxes. Inasmuch as ordinary expenses of operating city governments have risen to such heights and taxes were as burdensome as the people would stand, it was necessary to take the unpopular course of increasing rates. In many instances the increases in rates will be actually beneficial to the municipalities, inasmuch as operation of their utilities is being put on a business basis, not making them so dependent upon taxation to meet deficits."

It would be difficult, indeed, to find in a few words a more convincing argument in favor of making a real business of the management of municipally owned water-works.

The Cost of Public Health in Detroit

IN 1883, Detroit, with its 127,000 inhabitants, spent \$7,054 on public health, or about 5½ cents per capita. In 1921, with 942,000 people, Detroit spent \$1,527,355 for the maintenance of the Health Department, or \$1.62 per capita. Of this sum, 73 cents was

devoted to the maintenance of the Herman Kiefer Hospital. The maintenance item, less hospital charge, is 89 cents per capita.

In 1883 the total death rate per 1,000 people was 22.3. In 1921 the death rate was 11.

Smallpox by Popular Vote

IN the United States, say J. N. Force, special expert, and Dr. J. P. Leake, of the United States Public Health Service, in a recent Public Health Report, smallpox depends on the popular vote. Study of the smallpox statistics in twenty states for the last six years and of the vaccination laws in the same states indicates that the people have generally obeyed the vaccination laws that they have made. Where popular sentiment has sustained a strong centralized compulsory vaccination act, smallpox is to-day negligible; where local authorities have been given discretionary powers as to enforcement, the rate has tended to rise; and where the laws have lacked compulsory features or there have been no laws, the rate is high.

In the twenty states considered, four Eastern States show a combined smallpox curve that has been at a consistently low level for the six years. Seven Southern

States and six Central States show curves that are much higher and are very similar to each other, though that of the Central States is about twice as high as that of the Southern States. The three Pacific Coast States show a most extraordinary increase in the disease, the smallpox curve having soared from one nearly as low as that of the Eastern States in 1915 to one eight times as high in 1920.

Within each of these four geographical groups, the better the status of vaccination in the law, the lower is the smallpox rate. The states where vaccination of school children is generally required have little smallpox, averaging three cases a year for a community of 100,000 inhabitants; the states where there is no such requirement have 113 cases per year for each 100,000 persons, a rate high enough to make it probable that 1 person out of every 30 would at some time have an attack of smallpox.

City Demonstrates the Development of Electric Street Lighting

Progress of the Art of Street Illumination Illustrated in Kansas City, Mo.

By H. L. Dollahan

NOTABLE among the cities which have passed through the successive stages in the development of the art of street illumination is Kansas City, Mo. Illumination that was ample for certain streets, boulevards, traffic ways and parks ten years ago has become inadequate because of the growth and expansion of the city, as well as the introduction of new modes of transportation. The need of rehabilitation of the street lighting system in Kansas City was realized for several years, but such work did not seem to be advisable until late in 1920, when city officials felt

that prices were stabilized and financial conditions warranted the expenditure.

Street lighting contracts were formerly held by the Kansas City Power and Light Company and the Kansas City Gas Company. Outlying districts were illuminated with 250-candle-power series lamps, suspended by brackets and mast-arms from wooden poles. This form of lighting is very efficient and satisfactory for this class of service. The lights are suspended from 18 to 22 feet above the street, and the light is distributed by a reflector. The use of this form of lighting will be continued and



STREET SCENE IN KANSAS CITY, MO., SHOWING LIGHTING STANDARDS



BOULEVARD LIGHTING IN KANSAS CITY, MO.

extended to all outlying sections of the city where residence streets are unlighted at present and where gas lights need to be replaced.

The principal illumination on the business streets of the city was from cluster lights, each containing four 100-watt lamps supported on the trolley poles at a height approximately 14 feet above the curb line. On those streets not having trolley poles, a special iron pole or post was used for supporting the cluster lights.

At meetings of the Joint Light Committee of the Upper and Lower Houses of the City Council with the officials of the Kansas City Power and Light Company, all existing forms of street lighting and its future trend were thoroughly considered, with a view to obtaining a system suitable to the needs of the city at a minimum cost as regards installation and operation, and at the same time to secure an attractive appearance with an effective distribution of light.

The real purpose of a modern lighting system is not ornamentation of the streets, but protection to the public. With this object in view, the new lighting system was laid out so that all streets, traffic ways, and boulevards where traffic is very heavy were properly illuminated to facilitate the rapid movement of vehicular traffic and at the same time protect pedestrians. Properly illuminated streets eliminate the necessity of increased police protection and, whereas the four-light clusters burned only until 1 A. M., with one light all night, the new system provides for all-night service, for the additional cost of the small amount of energy consumed is fully compensated by the increased protection to those who must be out at all hours of the night.

The members of the Joint Light Committee of the City Council and the representatives of the Kansas City Power and Light Company spent about eight months in preliminary investigations, negotiations

and public hearings. A satisfactory contract was finally drawn up and an ordinance was passed in June, 1921, authorizing the Mayor to sign the contract on behalf of the city.

The New Fixtures

All the four-light clusters are to be replaced by General Electric Form 8 Novalux units, supported on trolley poles by a special cast iron ornamental bracket made by the King Manufacturing Company. This form of lighting was adopted as the standard for business streets having trolley poles. Where the traffic is heavy, the lights are placed on every trolley pole, while in the outlying districts they are staggered on alternate poles. A 600-candle-power, 20-ampere lamp is used on the Novalux unit in the down-town district, and a 400-candle-power, 15-ampere lamp in the outlying business districts.

A Form 16 Novalux unit supported on a King cast iron standard of Flemish design was adopted for the boulevards, parks, traffic ways, and the business streets not having trolley poles.

The new standard supports the light center 14 feet 6 inches above the base of the post. These standards have an average spacing of 200 feet and are staggered on both sides of the boulevards, streets and traffic ways, giving a very even and effective distribution of the light. Both Novalux units are equipped with alabaster ripple globes and metal canopies. The use of the alabaster ripple globe gives an intense white light, without showing the filament of the lamp.

The current for the lights supported on brackets on trolley poles is supplied from a 6.6-ampere series circuit carried by ridge pins on the tops of the trolley poles. The series circuit requires the use of only one wire instead of the two and three wires of the old multiple installations. A. G. E. aerial type transformer is used with the 15- and 20-ampere lamps. This transformer is mounted on the trolley pole immediately below the series circuit. Between the series circuit and the transformer there is a King disconnecting pothead with a film cut-out to furnish absolute safety. The low-voltage leads from the transformer enter the

trolley pole and immediately below the transformer come out at the point where the bracket is bolted to the trolley pole, thereby concealing the low voltage wiring. The use of the above type of installation thoroughly insulates the series circuit from the trolley pole.

The lights in the parks and on the boulevards, traffic ways and business streets are supplied with energy from 6.6-ampere underground series circuits. The conductor is a No. 8 solid single copper wire with 7/32-inch paper insulation, 5/64-inch lead sheathing, two layers of asphalted jute, and a braid of asphalted jute over all. The operating pressure is 4,500 volts. A G. E. subway type transformer and a King disconnecting pothead are installed in the base of the post, thereby eliminating the hazards from high-voltage wiring inside of the post. The use of the disconnecting pothead is a safety-first measure, as it permits the disconnecting of the transformer and lamp from the rest of the circuit, making it possible to repair the lamp installation, if necessary, with the rest of the circuit operating, and enabling the inspector to test the circuit in cases of underground trouble.

This installation is proceeding very rapidly. When complete, there will be approximately 4,000 of the bracket-type lamps supported on trolley poles, requiring the stringing of over 650,000 feet of No. 6 W. P. wire for aerial conductors, and 3,500 of the post type lamps requiring the installation of over 700,000 feet of underground conductor. There will be approximately 250 G. E. 20-kilowatt outdoor-type constant-current transformers. The entire cost of the installation is being financed by the Kansas City Power and Light Company. There will be about 12,500 lights, including the 250-candle-power lamps which were in service at the time work was started and those used to replace gas lamps in the residential district.

The investigation of street lighting methods by Kansas City, Mo., was carried on by Aldermen Bryce Smith, William Scannell and James Melody of the Upper House and Aldermen Edward J. McDonald, John J. Manning and F. L. Berry of the Lower House.

State Aid for Pennsylvania Municipalities

By James F. Woodward

Secretary of Internal Affairs of Pennsylvania

FOR many years past, Pennsylvania cities and boroughs, as individuals, have worked diligently for civic development. Civic improvement advocates working for the betterment of local conditions led state officials and the Legislature to take cognizance of their ambition to improve municipalities. The climax of the municipal movement came in 1915 with the legislative creation of a Bureau of Municipalities in the Pennsylvania Department of Internal Affairs. The sole purpose of the Bureau is to cooperate with the boroughs and cities of the Commonwealth in improving local conditions.

The original act creating a municipal bureau, it later developed, so hampered constructive work that the Bureau could accomplish things only in a very small way. The Legislature, in session again in 1919, broadened the scope of the Bureau's possibilities and enabled the Department of Internal Affairs through this division to branch into many forms of municipal endeavor.

The departmental bureau maintains a trained corps of municipal experts to extend free aid to the municipalities within

its boundaries. Since the creation of the Bureau many inquiries have been directed to Pennsylvania by other states as to the accomplishments possible. We are confident that, before many years pass, every state will have a bureau or department similar to the one in Pennsylvania for the help of municipalities.

The municipal division of the Pennsylvania Department of Internal Affairs touches on every phase of municipal government and municipal development. It has in its employ city and town planning engineers, landscape architects, expert accountants, municipal engineers, and others trained for municipal work. The procedure of procuring their services in a municipality, large or small, is simple. A request from the mayor, a Burgess or the council directed to the Secretary of Internal Affairs of Pennsylvania and asking for the services of one of the Bureau men to assist in working out a particular problem, is sufficient.

It may be that the borough or city making the request desires the installation of a modern budget or accounting system; the planning of a municipal park or playground;

the working out of an entire city planning proposition, which, as is well known, entails a considerable amount of time and study; assessment matters may be the cause for asking aid, or it may be that only a minor question regarding the numbering of houses on a newly developed street has necessitated the seeking of outside advice. No matter how large or how small the job involved in the request may be, the law permits and authorizes the giving of all as-



SUGGESTED STREET EXTENSIONS AND WIDENINGS, PREPARED FOR MCKEESPORT BY THE BUREAU OF MUNICIPALITIES

sistance possible.

Scores of Pennsylvania cities and boroughs in the last two years have taken full advantage of the help extended by the Commonwealth, and the result is that many of them now find themselves working along modern lines so far as finances are concerned; more of them have municipal parks and playgrounds; while others are developing and being bettered in numerous ways under the proffer included in the legislative enactments.

It may be proper at this time to point out that the help it is possible to accord municipalities by the Department of Internal Affairs is free of all cost. In the establishing of a budget and accounting system in a city or a borough which has made a request, it is necessary to send an accountant to that particular municipality until the system is thoroughly established. In the preparation of plans for parks and playgrounds, it may be necessary for a landscape architect to make several visits to the site before the details are completed. Even in these matters, where considerable expense is involved, the municipality is not asked for pay; but instead, the state, through appropriations made for the maintenance department, foots the bill.

In park and playground propositions the completed plans show the necessary grading, planting and other details, so that it will be possible for the municipality to proceed with actual development immediately upon receipt of the drawings. Actual development of the land, however, is entirely the work of the municipality.

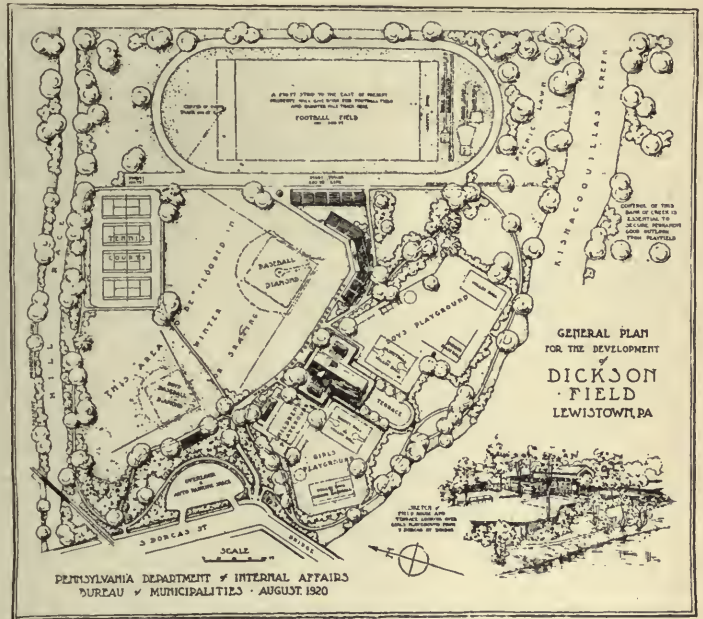
The Coordination of Statistics

The service of experts in planning and advising is only a part of the actual work done by the department's Municipal Bureau. Annually, statistics dealing with every phase of municipal government are gath-

ered by its men in all the cities and several hundred of the boroughs of the state. These statistics have to deal with fire departments, police departments, water departments, financial accounts, appropriations for various purposes, parks, street paving, sewerage systems and sewage disposal, street lighting, taxation and assessment matters, garbage disposal, bond issues, and other questions as well.

Following the gathering of this information, data thus procured are compiled and tabulated so that it is possible to make comparisons of governmental operations and costs in the respective classes of municipalities. There are at the present time 38 third class cities in Pennsylvania. The following may serve as an example of the use of municipal statistical compilations:

Taxation figures gathered in each of the cities show: the assessed valuation; the assessor's or city clerk's estimate or the percentage that the assessed value bears to full value; the estimated full value based on the assessment and the percentage of the full-value figure; millage for all city purposes; the millage if based on full valuation instead of partial valuation, which assessments usually represent; the total millage for general purposes; millage for interest and debt service; millage for the



A TYPICAL PLAYGROUND LAYOUT PREPARED BY THE BUREAU OF MUNICIPALITIES

poor fund; millage for improvements; the assessed valuation per capita, and the per capita taxation for all city purposes. These figures for all of the cities of the third class are tabulated on big sheets, so that it is possible to show at a glance just exactly how one city compares with another under the various items. Similar tabulations are made for every other division of municipal government.

As the various statistical sheets are completed, they are blueprinted and copies forwarded to officials of the various cities who are most interested in the particular subject covered by each sheet. This procedure enables all of the cities of one class to become familiar to a certain degree with the activities of other cities. Likewise, it saves municipal officials considerable time and trouble, for, prior to the establishing of the Municipal Bureau, city officials desiring information on one subject or another would, of necessity, be compelled to communicate with officials of other municipalities to procure the desired information. The Bureau has proved a remarkable time-saver in this regard and is acting as a clearing-house for municipal information.

Boroughs in Pennsylvania range in popu-

lation from a few more than 100 to over 30,000, and there are approximately 950 of them in the state. Municipal statistics, similar to the statistics of third class cities, are gathered from several hundred of the representative towns. The boroughs, for the purpose of comparing information concerning them, are grouped according to population, so that when information is sought by one borough, the information given it is that procured from other boroughs of its approximate size.

Questions of all kinds are received daily, and they are given immediate attention by men trained in respective municipal lines. Some of the inquiries relate to ordinances of various kinds, and the department has on file several thousand ordinances relating to all kinds of municipal subjects. Advice on the drafting of ordinances is given when request is made.

Parenthetically, it may be stated that at no time does the department endeavor to persuade a municipality, large or small, to do one thing or another. In this regard it keeps absolutely neutral and confines itself to the giving of advice, permitting the municipal officials to be the judge of the proper thing to be done.

On the Calendar of Conventions

JUNE 19-24.—SAN FRANCISCO, CALIF.
International Association of Chiefs of Police. Annual convention. Secretary, George Black, Chief of Police, Wilmington, Del.

JUNE 19-30.—CHAUTAQUA, N. Y.
General Federation of Women's Clubs. Biennial convention. Corresponding Secretary, Mrs. George W. Plummer, 878 North Clark Street, Chicago, Ill.

JUNE 20-23.—COLORADO SPRINGS, COLO.
National Association of Comptrollers and Accounting Officers. Annual convention. Secretary, Mark M. Foote, Comptroller's Office, Chicago, Ill.

JUNE 21-22.—CROOKSTON, MINN.
League of Minnesota Municipalities. Annual convention. Executive Secretary, Morris B. Lambie, The Municipal Reference Bureau, University of Minnesota, Minneapolis, Minn.

JUNE 21-22.—STROUDSBURG, PA.
Association of Pennsylvania Boroughs. Annual convention. Secretary, J. HERMAN Knisely, Capitol Building, Harrisburg, Pa.

JUNE 22-24.—FORT WAYNE, IND.
Indiana Commercial Secretaries Association. Annual convention. Secretary-Treasurer, G. L. Baker, Wabash, Ind.

JUNE 22-29.—PROVIDENCE, R. I.
National Conference of Social Work. Annual meeting. General Secretary, William H. Parker, 25 East 9th Street, Cincinnati, Ohio.

JUNE 26-30.—SEATTLE, WASH.
National Organization for Public Health Nursing. Annual meeting. General Director, Anne R. Stevens, 870 7th Avenue, New York, N. Y.

JULY 3-9.—BOSTON, MASS.
National Education Association of the United States. Annual meeting. Secretary, J. W. Crabtree, 1400 Massachusetts Avenue, N. W., Washington, D. C.

JULY 14-15.—DULUTH, MINN.
Minnesota Association of Community Secretaries. Summer meeting. Secretary-Treasurer, W. E. Olson, Mankato, Minn.

JULY 27-28.—WILMINGTON, N. C.
North Carolina Commercial Secretaries Association. Annual meeting. Secretary, W. T. Ritter, Winston-Salem, N. C.

AUGUST 15-17.—CLINTON, IOWA.
League of Iowa Municipalities. Annual meeting. Secretary, Frank G. Pierce, Marshalltown, Iowa.

AUGUST 15-18.—SAN FRANCISCO, CALIF.
International Association of Fire Engineers. Annual meeting. Secretary, James J. Mulcahey, City Hall, Yonkers, N. Y.

AUGUST 21-SEPTEMBER 2.—EVANSTON, ILL.
National School for Commercial Secretaries. Address: Robert B. Beach, Business Manager, Association of Commerce, Chicago, Ill.

AUGUST 28-SEPTEMBER 2.—DETROIT, MICH.
National Safety Council. Annual Safety Congress. Secretary, W. H. Cameron, 169 North Michigan Avenue, Chicago, Ill.

OCTOBER 1-6.—CLEVELAND, OHIO.
American Society for Municipal Improvements. Annual convention. Secretary, Charles Carroll Brown, P. O. Box 234, St. Petersburg, Fla.

OCTOBER 16-19.—CLEVELAND, OHIO.
American Public Health Association. Annual meeting. Secretary, A. W. Hedrich, 370 Seventh Avenue, New York, N. Y.

OCTOBER 23-25.—CHICAGO, ILL.
National Association of Commercial Organization Secretaries. Annual meeting. Secretary-Treasurer, John E. Northway, Chamber of Commerce, Hamilton, Ohio.

The Administrative and Financial Machinery for Carrying Out the City Plan

By Herbert S. Swan
City Planner, New York

QUITE as important as the city plan itself is the financial and legal plan devised to carry out the improvement contemplated by the plan. How to apply the city's resources toward the carrying out of a plan in a manner that will neither embarrass the city's finances, endanger the solvency of individual property owners, nor unduly disturb the conduct of business during the execution of the plan, are administrative problems of major importance which must be thought out before any real plan can be undertaken with a view to successful completion. Both the city and the property owner must be in a position to pay for the plan, or the plan can, of course, never be realized. It is this homely fact which necessitates the consideration of such technical, but none the less fundamental, matters as the establishment of proposed street lines upon the city map, the control of improvements within the lines of mapped streets, condemnation, damages, special assessments, assessment bonds, debt limits—indeed, the entire administrative and financial machinery necessary to be set in motion for the carrying out of the plan.

The Establishment of Proposed Street Lines

The first step in carrying out a street plan must of necessity be the establishment of the proposed street lines and their incor-

poration as a part of the city plan. Only through placing the projected widenings and extensions upon the official map of the city can owners develop their property in accordance with the city's program of improvement.

The mere mapping of the proposed improvements injures no one. Every plot can be used as the owner would have used it if the projected street lines had not been laid down upon the city map. Mapping a street over private property is a quite different thing from taking private property and, until property is actually taken, there need be no compensation. Since owners have the right to disregard the plan, so, too, has the city—it may change or modify the plan, or it may refrain from ever carrying out the improvement if it so elects.

As this is the law, wherein, then, is the advantage of placing the proposed street widenings and extensions upon the city map? The chief outstanding advantage lies in the fact that it gives the city a constructive program of development; it focuses public attention upon a group of coordinated improvements which when executed will fit into a comprehensive scheme promoting the highest development of all parts of the community. If they are not placed upon the map, they will never be carried out, and if they are not placed upon the map until the

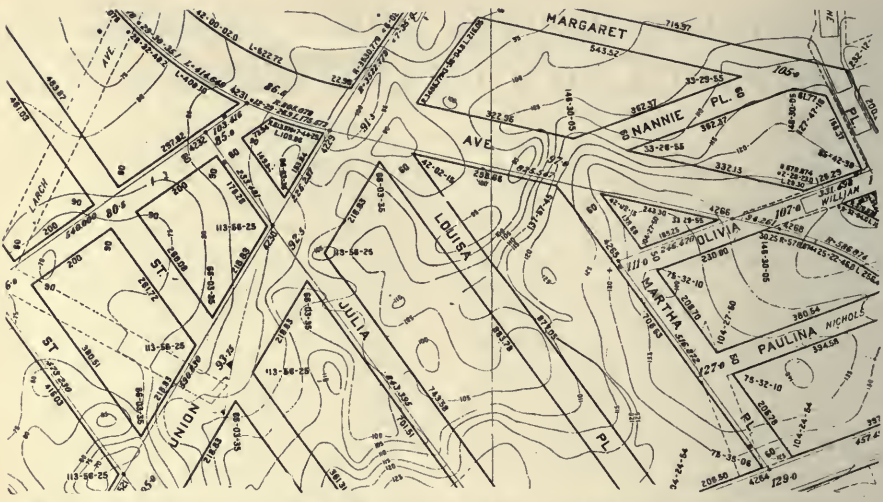
city is ready to carry them out, their execution is likely to be deferred for many years after the time their execution would otherwise be possible.

The fact that these improvements have been placed upon the official map after an exhaustive survey of the needs of the whole community will, moreover, tend to prevent the spending of public moneys upon relatively unimportant improvements.



STRAIGHT STREET, PATERSON, N. J.

Notwithstanding a proposed widening from 50 to 80 feet on the left side of this street, the owners of the house on the corner were demolishing it and preparing to build a substantial building, May 23, 1922



A TYPICAL SECTION FROM THE OFFICIAL MAP OF THE CITY OF NEW YORK

All owners without exception are anxious to improve their property in a manner to increase its value. Until an official map is adopted, they are denied the privilege either of improving their property in a manner to give its value the maximum enhancement or of helping the community to attain a comprehensive plan.

Immediate Acquisition of Vacant Land Within Proposed Street

All vacant land within projected street lines should be immediately acquired by the city. Such land presumably will never be cheaper to acquire than now. So long as the city refrains from acquiring the land within mapped streets, the owner, of course, has the right to use it as he chooses. The land is his until it is actually taken by the city, and until that time he has not only a right to develop it and to erect buildings upon it, but a right to put up buildings with the single object of extracting larger damages from the city when his property is taken.

For the city to defer taking the land that is at present vacant within mapped streets, whether such streets be widenings or extensions, is in effect to give tacit approval to its development without reference to the official plan. If the map may be changed and the street completely abandoned without any indemnity against loss being guaranteed the owner on account of compliance with the plan in the development of his property, certainly the owner cannot be

blamed for taking his own counsel in improving his land and ignoring the mapped street.

Justice to the owner of vacant land within projected street lines, who will suffer serious loss in observing the plan should the city alter its intention of ultimately taking his property, as well as justice to the taxpayer, who by the refusal of the municipality to take such lands immediately, would through rising land values and the erection of costly buildings be burdened with increased taxes, both demand that the land now unbuilt upon be purchased without delay. The acquisition of such lands is, moreover, the best pledge a city can give of its intention to carry out its program of improvement.

The appropriation of so much of the front portion of vacant lots, or of the forecourts of improved lots, as might be necessary to afford the increased width to the widened thoroughfare, would make the owners in front of the widened portions, distributed here and there as they would be throughout the length of the new street, the staunchest advocates of the quickest possible completion of the improvement.

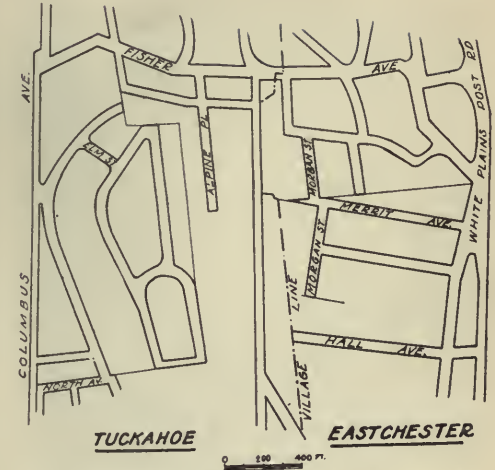
With part of the street widened, the owners along the widened portions would never rest until the entire thoroughfare was widened. There would be no turning back from the plan; in fact, there could be no turning back from the plan, because the city would stand irrevocably committed to the undertaking.

Gradual Recession of Fronts in Built-on Portions of Widening

The acquisition of the vacant land within the projected lines of a street, of course, still leaves the built-on land to be acquired before the street is completed. Alterations in street lines are at best always difficult and expensive to effect, but in the case of improved properties, they are doubly difficult and expensive. The land values exceed the building values in very few localities; indeed, outside of the business sections, the building values are almost invariably greater than the land values, and in cases where land in the outlying sections is improved with expensive buildings, this excess is often manifold. The prudence of proceeding most cautiously with the widening or extension of streets through built-up localities is therefore obvious.

When it comes to the extension of a street, very little choice is left to the city; to get any benefit at all from the street, it must expropriate both the vacant and the improved lands at once. Unlike the case of a street to be widened, there is in the case of a street extension, no existing street, not even a narrow one, to be used by traffic. The use of the thoroughfare cannot, therefore, go on hand in hand with its acquisition; all of it has to be acquired before any part of it can be used even to the slightest degree. Every consideration of prudence and expediency demands that an extension be carried out as an integral improvement without delay.

But in the case of a street widening, economy demands—unless the increased width is required at once—that the widening be made as, and when, the existing buildings are demolished and reconstructed. At that time the new building can be made to recede to the new street lines, thus relieving the city of all damages for build-



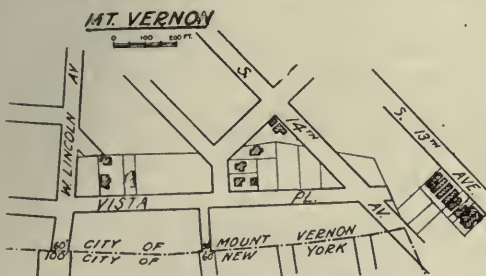
BAD DEVELOPMENT WHERE NO CITY PLAN CONTROLLED

ings. This method of widening streets has been exercised on several different occasions in the development of the city of Philadelphia.

It would be disastrous to the city to require that all the streets in need of widening should be widened in their entirety at once. By gradual widening as, and when, old buildings are replaced by new ones, progress is made step by step towards a wider street without unduly straining either the city's or the property owner's finances to pay for it.

Plating the new or widened street upon the city plan interferes with no one in the use and enjoyment of his property until he comes to rebuild. This may be in a year, ten years, or a hundred years. But when the property owner does rebuild, his building must recede to the new street line. It is then that he is injured, if he is injured at all; and it is then that his land is taken for public use, and he is entitled to have his damages assessed.

The instant an old building is torn down, the city takes that part of the plot within the widened street for public use. Existing buildings are not interfered with. Immediately upon the destruction of the old building, the city takes possession. Recession follows upon the rebuilding or altering of the front of the buildings now erected. The moment this rebuilding is commenced is therefore the moment of taking which gives the person whose land is taken the right to damages.



WHERE TWO CITIES MEET
A striking example of the failure to plan



MARKET STREET, PATERSON, N. J.
A widening from 50 to 70 feet on the left side was under consideration, May 23, 1922.

Making Improvements Pay for Themselves

Judicious expenditure on a well-thought-out city plan usually results in an appreciation of neighboring land values that is at least equal to the sum expended upon its execution. In some instances, the enhancement in near-by values may even exceed the cost of an improvement.

Through the assessment of benefits, a city plan may, to a large extent, be made to pay for itself without encroaching upon the municipality's borrowing power, increasing the general tax rate, or throwing new financial burdens upon those least able to bear them.

It is a rare improvement that does not confer some local benefit which should be assessed, the assessment being limited only by the cost of the improvement and the amount of benefit conferred. The city should assume no part of the cost where the local benefit is sufficient to pay the whole expense. Only in instances where the local

benefit does not equal the cost of the improvement, should the city at large participate in the expense. When the city assumes part of the cost, the sum assumed should be limited by the amount that the local benefit falls short of defraying the whole cost.

Property can be assessed only for an actual benefit derived from an improvement. The assessment may not be for benefit that is speculative and distant or dependent upon remote and uncertain contingencies. The benefit must be substantial, certain and capable of being realized within a reasonable and convenient time. An assessment cannot be levied if, in the opinion of the courts, the measure is premature and will cost more than the proprietors of the adjacent land will be benefited by the improvement.

To be assessed, property must be of such a nature that its value is capable of actual enhancement in consequence of an improvement. Unless this enhancement in value is susceptible of reasonably accurate measurement, the property cannot be assessed. An assessment should represent the difference between the value of the property before and after the improvement. In levying an assessment, the enhanced value of property by reason of the improvement should be taken into consideration.

The assessment of benefits will make great improvements immediately possible which if paid for by bond issues would have to be deferred for many years. A city's borrowing capacity is quite commonly limited by law to a certain per cent of its assessment roll, and many cities are very near their debt limits. Such cities, to carry out any comprehensive plan of street widenings or extensions, will probably find special easements the best means of financing their program.

The Need of Municipal Fire Alarm Systems

Special importance should be placed upon the necessity of designing, installing and maintaining fire alarm systems, so that alarms may at all times, and under the most adverse conditions, be promptly transmitted to fire departments. To this end, attention is called to the supreme desirability of providing headquarters which, as far as practicable, will be free from liability to damage by fire from internal or external causes; of installing apparatus suited for promptly and correctly transmitting alarms, but which will be simple of operation and easy of maintenance; of placing all wires outside of buildings as far as practicable underground; of frequent and systematic tests of all apparatus; and of having in charge of such systems only men of known judgment and ability.

—From report of Committee on Signaling Systems, National Fire Protection Association.

Devices for Traffic Control

By C. H. Shepherd
Consulting Engineer, Chicago

THE problem of handling or dividing traffic on the park and boulevard systems in the large cities of this country has grown to be extremely serious with the great increase in the number of vehicles and their speed.

It is unfortunate that the foresight of the planners of the original city streets did not extend into or beyond the present day, but the conditions which they established are now in existence, and must be reckoned with.

Many devices for handling, slowing down and dividing traffic have been put into operation with varying degrees of success. In cases where it is necessary for pedestrians to cross streets filled with swiftly moving automobiles and other vehicles, it has been found expedient to establish islands of safety in the center of the roadway so that persons passing from one side to the other may find a safe and secure stopping-place after crossing one stream of traffic and before attempting to cross through the stream moving in the opposite direction. In the case of Chicago as well as other large cities, the difficulties have been greatly aggravated, not only by the tremendous increase in traffic and by the narrowness of streets and boulevards which were ample during the days of the horse, but also because the great length of the streets makes it impossible to place traffic officers at all intersections.

Since the opening of the Michigan Avenue Boulevard Link connecting the down-town business district, or loop, of Chicago with the extensive north side boulevard system under control of the Commissioners of Lincoln Park, the speed of unimpeded traffic has greatly increased, but the congestion, instead of growing less, has increased to the point of practical immobility at certain times.

The first step in traffic control taken on the Lincoln Park system many years ago, was the installation of safety island lights along the various boulevards. As these islands were placed at various intersections where it was necessary to slow up, divide

or divert the stream of traffic, it became the practice to station traffic officers at such intersections during the rush hours, and as a rule these officers stand either in front of or behind the islands. In conjunction with the installation of safety islands the curb corners at prominent intersections were rounded off, thereby providing a longer turning radius for automobiles and allowing a higher speed in turning corners.

The Safety Island Lights

The first safety islands used on this system were of concrete molded in the shop, and were set by means of a crane, at the proper intersection on the building line of the cross-street and in the middle of the boulevard. The lighting standard was of cast iron, carrying a ruby globe, 18 inches in diameter, in which was installed a double cluster of incandescent lights. Each cluster consisted of four 16-candle-power, 110-volt



SIMPLE POST, LIGHT AND BASE



POST WITH TWIN BASE LIGHTS AND GOOSE-NECK TO SHOW OFFICER

carbon lights, which were connected in multiple and fed from the secondary of a series-multiple transformer whose primary was connected in the series circuit used to illuminate one side of the boulevard. Inasmuch as there was a circuit on each side of the boulevard, each safety island was connected to two circuits, each circuit feeding one cluster in each island, making a total of eight lights, or two clusters of four lights each. It is evident that the factor of safety in such an installation was high, for in case one circuit was out, the remaining cluster still had four lamps in service. Also, the fact that low-tension, secondary current was used to supply the safety island lights minimized the danger of shock to the public in case of collision.

The original safety islands were not equipped with base lights as shown in the illustration, but the large number of collisions due to cutting off the driver's view of the red globe by the automobile top made it advisable to install base lights so that both high and low vision could be used. This was done by installing a red

marine fixture on each side of the base of the standard, each fixture containing a 56-watt, 110-volt railway lamp connected in parallel with the lamps of its corresponding top cluster. The reduction of accidents by means of the base lights was very gratifying. As may be seen from the accompanying photograph, either the top or the bottom warning signal should be visible at all times.

In order to render the traffic officer visible at night, a spot-light, consisting of a bowl reflector mounted on a pipe gooseneck and connected in parallel with one of the cluster circuits was installed at locations where the traffic officers were stationed. Each spot-light was controlled by an ordinary key-type snap switch, and when in service illuminated not only the traffic officer but also the safety island base. Different types of spot-lights are shown in the accompanying illustrations.

While collisions can be greatly reduced by such methods, a certain number of accidents are bound to occur and it is apparent



IMPROVED POST WITH TWIN BASE LIGHTS, ISLAND BASE AND SPECIAL REFLECTOR

that a dark island constitutes a serious menace to traffic. Hence it is necessary to devise some means of restoring signal service quickly in case a post is demolished. This was accomplished in Chicago by means of the temporary safety island light standard shown in the accompanying photograph. It will be seen that four fingers were provided to slip into the handhole of the island, and two clusters were provided in the top globe. The main leads were provided in the top globe. The main leads had slip type cord connectors, so that in case of emergency it was only necessary to take the temporary post to the point of accident, remove the handhole cover, disconnect the broken leads, connect the emergency leads and erect the post, all of which made it possible to provide emergency signal service anywhere in the system within thirty minutes after the receipt of the accident report.

With the increase in traffic on the boulevards of the Lincoln Park System it became apparent that some means was necessary to enable a traffic officer to handle both the boulevard and cross-street traffic for several blocks on each side of his station.

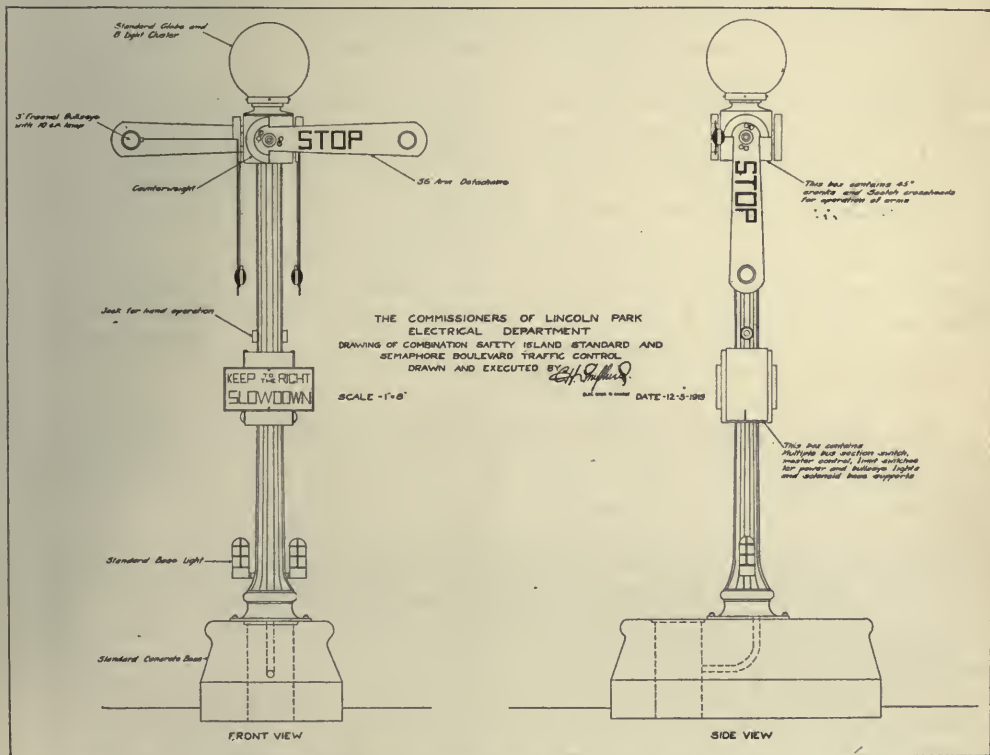
After investigation, it was found that this problem, like many others, could best be solved electrically, and accordingly the writer designed a semaphore system for the purpose. Unfortunately, changes of administration and other matters prevented the carrying of this project to completion, but the scheme itself is very interesting.

A Semaphore System

The semaphore standard consists of an adaptation of the regular safety island lamp-post with certain changes which are necessitated by the general type of construction. Two stop-arms are set to oppose



EMERGENCY LIGHT, USED AFTER ACCIDENTS TO FIXED STANDARDS



PROPOSED COMBINATION SAFETY ISLAND STANDARD AND ELECTRIC SEMAPHORE

traffic on each street, the idea being that the flow should cease when the arms are against either street, and resume when the arms drop. A further feature of the system is that by dropping one set of arms to an angle of 45 degrees with the horizontal and raising the other pair to the same relative position, warning to get ready will be given. In this way the "Stop," "Get Ready" and "Go" signals are incorporated in the action of two pairs of arms which carry nothing but the word "Stop." The arms themselves are detachable and in the end of each is a two-way red bull's-eye for use in night work. The action of the entire mechanism is perfectly balanced, requiring only a slight pull to throw the arms to any position.

The standard carries the usual top globe, double cluster and base lights, the normal operation of which is in no way interfered with by the semaphore mechanism, which is operated from entirely separate and independent circuits. Each standard carries a master control switch, a bus section switch, and a jack for hand operation, and each being a duplicate of all others on the same system, it is possible by means of proper switching to operate any one standard alone; to operate all or any number of others from any standard interchangeably; or the system may be operated in whole or in part by a traffic officer located in an elevated control station, which may be placed in a most advantageous position for observation of traffic movements.

It is obvious, therefore, that any desired number of combinations may be obtained for various situations encountered in the handling of large masses of traffic; and such a system is admirably adapted for handling traffic for some distance each way

from the main control station. In case it is desired to hold all vehicles away from a boulevard, or to clear a boulevard for police or fire purposes, this may be easily done by setting signals against all cross-street traffic.

By proper design, the extent of this system may be increased to any point within reason. Lack of space prevents the showing of mechanical and electrical details of the semaphore standard itself, but these points are very simple as well as electrically and mechanically correct.

Briefly stated, the circuits consist of a means for supplying direct current of the proper voltage, capacity and regulation, to a multiple four-wire bus consisting of a positive and negative feeder bus, and a double positive control bus. Power is supplied to the operating solenoids from the feeder bus, their movements being controlled by a master control switch which is automatically held in zero position by a center spring when not in use, and in either the "Stop" or the "Go" position by a series retaining coil tapped off the feeder bus positive, until such time as the stroke of the solenoids is completed in either direction, when the circuit is opened on the completed, and closed on the impending, stroke by the action of the automatic limit switch. Since all units are duplicates, and the entire system may be operated from any unit, it is evident that the operating master control switch will not be released until the last signal in the bank has completed its final stroke.

The cost of this type of system is extremely reasonable, considering the results of its installation, and its possibilities are unlimited, if properly engineered.

An Error in the Report of Gainesville's Population

In the article "Making a Municipal Light and Water Plant Pay," by G. H. Cairns, City Manager, Gainesville, Fla., the figure as published in the 1920 census was inserted for the population. Mr. Cairns writes:

"The question of population in this city has been rather a sore subject to its citizens since the Federal census was taken in 1920. At that time a figure of 5,000-odd was returned by the takers. However, the local Chamber of Commerce, knowing this to be incorrect, had the census retaken after having been properly authorized by the

Government. This time the total count was found to have been 6,860.

"This figure does not include about 1,000 students regularly in attendance at the State University.

"Needless to say, the city has grown considerably since the census was taken, and a directory firm of good standing, who have only recently made a canvass of the city preparing a new directory, assure us that about 10,000 bona fide names will be shown in this year's issue."



UNFORTUNATE DAILY EVENTS "ON THE ROAD TO CANEY"

Mud and Ruts Strangle a County

A Kentucky County Practically Isolated by Bad Roads

THE two pictures above show roads which have been in existence for a great many years between Pippapass and Wayland, Ky. The distance between these two towns is twelve miles, Wayland being the railroad or shipping point. Running to the county-seat in the other direction from Pippapass are 8 miles of road in just as bad condition. There is not a single mile of improved road nor a mile of railroad in Knott County. The only travel is by wagon or horseback along the sides of mountains or through the beds of creeks without bridges or culverts. When the creeks rise, the county is practically cut off from all communication with the outside world. In this county is located the Caney Creek Community Center, which is doing such remarkable work for the unfortunates

of that section who are isolated from the activities of the world by poor roads.

How much better off a community is when it is served by hard-surfaced roads, maintained in good condition throughout the year, with the snow removed in winter to enable traffic to pass through the community and to its rail centers at any time during the winter months! Many states are slowly pushing their improved road systems into the remote corners and along what were but a few years ago the byways of the state. In this way, states, counties and towns are knitted together more closely and have more common interests. Through the highway, trading becomes easier, education is more easily secured, and life generally made happier for the small community.



A WELL-DRAINED SURFACED ROAD IS A DISTINCT ASSET TO A COMMUNITY

Gasoline Engines Are Servants of Many Municipalities

Whether Installed in Autos or Motor Trucks, or Running Concrete Mixers,
They Are Always Ready for Action



A WHITE POLICE PATROL AND AMBULANCE, VILLAGE OF OAK PARK, ILL.



A GROUP OF AMBULANCES MADE BY THE WHITE COMPANY FOR THE SERVICE OF THE
BOSTON CITY HOSPITAL



BUILDING THE HARLEM CREEK SEWER, ST. LOUIS, MO.

The Smith tilting mixer illustrated was sold to the Department of Streets and Sewers by the George F. Smith Company, of St. Louis



THIS 2 1/2-TON STANDARD TRUCK, WITH 3-SECTION TRENTON TOWER OPERATED BY A WOOD HYDRAULIC HOIST, IS USED IN STREET RAILWAY MAINTENANCE WORK, DETROIT, MICH.

Worth-While City Work for the Unemployed

AS a means of helping to solve the unemployment problem and at the same time to get needed public works done, the Common Council of Schenectady, N. Y., recently authorized a bond issue of \$100,000, the proceeds of which were used to give aid to the unemployed through providing work which at the same time removed a serious flood hazard in the city.

Schenectady is crossed by three large creeks and culverts which run under the business and residential sections and under some of the largest industries. One of them, Veeder Creek, runs under the city for a distance of more than three-fourths of a mile, finally emptying into the Mohawk River. This culvert, the largest in the city,

lowered approximately 4 feet, thereby permitting the water to flow more freely and minimizing flood conditions during heavy rainfalls.

This is the first time that the culvert has been cleaned in many years. The work at first was quite precarious because the workmen could not enter the culvert for any distance on account of high water and sewer gas. An extra manhole was built about 1,400 feet from the entrance in order to allow the sewer gas to escape. As the refuse and waste were dug from the bed of the culvert, they were loaded onto a scow, which was dragged to the entrance by the workmen, and the débris was then loaded into trucks and carried away. In

the older section of the culvert there is a plank flooring sloping toward the river. The water in this section rushes along at the rate of 16 miles an hour, and the floor was so slippery that it was impossible for the workmen to maintain a footing. However, the men chosen by the unemployment committee as being the most deserving to receive these city jobs proved equal to the task. The accompanying photograph shows the workmen with a partly loaded scow, and the smaller culvert to the left of the picture



SCHENECTADY FINDS WORK FOR UNEMPLOYED IN CLEANING CITY'S SEWERS

was badly choked. For several weeks a gang of workmen varying in number from 20 to 70 were engaged on the task of digging out the waste material and débris which had accumulated in this and the smaller culverts. Hundreds of tons of this waste material were taken out, and as a result the water-level in the culvert has been

gives some idea of the cramped quarters in which the workmen had to work.

What Schenectady did is only a sample of the many odd municipal jobs that need to be done and that can be made the means not only of protecting the city against hazards, but also of providing employment for those in need of it.

A city's real strength is not in its dollars per capita; it is in its character per capita.

Chamber of Commerce Activities in Public Affairs

Middletown's Civic and Industrial Exhibition

MIDDLETOWN, CONN.—The combined Civic and Industrial Exhibition of local products and activities recently held at Middletown, Conn., and sponsored by the Chamber of Commerce, had an immediate favorable effect upon public morale. Not only did this exhibition fulfill the usual function of satisfying the curiosity of the citizens as to what is being done in their community, but it set before them in unmistakable language the community's strength and resources, both tangible and intangible. It put an end, for the time being at least, to an undercurrent of pessimism which was beginning to acquire considerable headway.

From a purely artistic point of view the exhibition was perhaps quite as successful as from the standpoint of public morale. There were two distinct sections, industrial and civic, the former occupying the first two-thirds of the exhibition floor and the latter occupying the rest of the floor to the

rear. Seventeen civic and social agencies were represented, and 31 industrial and commercial firms. The industrial and commercial booths were of the standard 10- x 10-foot type, with side and rear panels; the civic and educational booths formed a complete scheme of their own, being specially made and decorated. The illustration shows both the general arrangement of the floor and also the design for the civic and educational section; the latter included a blue and white color scheme which was remarkably effective.

This show developed nothing new to exhibition science. It did, however, bring out the fact, sometimes overlooked by those in charge of public displays, that the less the amount of distracting influences, such as excessive decoration, loud music, etc., the more attention is paid to the exhibits themselves. From all points of view, especially the financial side, this is well worth remembering.

T. L. HINCKLEY,
Secretary, Middletown Chamber of Commerce.



A PORTION OF MIDDLETOWN'S CIVIC AND INDUSTRIAL EXHIBITION

Ballinger Votes for Paving

BALLINGER, TEX.—A study of the street-paving and water-supply problems confronting this city was instituted last fall by committees from the Young Men's Business League and resulted in the calling of a bond election on April 18, at which bond issues for the improvement of both these utilities carried by a vote of 370 to 150. About \$125,000 worth of street paving will be laid in the business district, replacing the water-bound macadam laid several years ago. The present water-supply will be practically doubled by the building of additional reservoir capacity.

Several months ago the League fostered a campaign for the municipal ownership of light and power, following which, sufficient bonds were voted to build a modern plant. This is now supplying practically every residence and business house in the city. The Business League was also instrumental in securing the teaching of fire prevention in the public schools, which brought about a substantial reduction in the fire insurance key rate, and is expected to greatly lessen fire losses in the future.

The commercial organization now has in hand the marking, mapping and advertising of three cross-state highways which pass through this city, and the building and equipping of a modern tourists' camp.

STUART L. WILLIAMS,
Executive Secretary, Young Men's Business
League.

Chamber Demonstrates the Value of Organized Effort

WHEELING, W. VA.—After having voted down bond issues on three different occasions during the past ten years, providing for a filtration plant and other related improvements, the citizens of Wheeling, by a three-to-one vote on April 20, ratified a two-million-dollar bond issue for this purpose. It provided for a rapid sand filtration plant, extension of water-mains to all suburban sections of the city, rehabilitation of the present water-works, five million gallons additional reservoir capacity, and the purchasing of two private water companies now serving the suburbs. Work will be started just as soon as the bonds can be sold and contracts let. Employment will be provided in the near future for almost one thousand men.

Several weeks prior to the election at which the bond issue was ratified, the Chamber of Commerce through its Civic Committee built up the greatest organization in its history. Complete cooperation was given by the Rotary, Kiwanis, Lions and Women's Clubs, the League of Women Voters and practically every social, fraternal, and labor organization in the city. The four daily newspapers also supported the project wholeheartedly. Sufficient funds were raised by the Chamber's committee from the members to cover campaign expenses.

An educational campaign was planned and carried on for twelve days preceding the election. Display advertising was used in quarter-page space in each of the four daily newspapers during this time. The Chamber's Publicity Committee and the city officials cooperated in furnishing the material. Fifteen thousand pamphlets were printed and distributed to every home in the community. These pamphlets thoroughly explained the proposed improvements, the cost and the benefits to be derived, as well as what the cost would be to the taxpayers, to pay off the interest and principal. Fifteen thousand novelty buttons with the inscription "Vote for Pure Water" were distributed among the 10,000 school children and others in the community about one week prior to the election; 500 large muslin signs bearing the same message were placed on 500 automobiles the day before the election. Window displays showing the muddy river water which the people of Wheeling have been using for years, compared with filtered water, were placed in many sections of the city.

Four-minute men organized by the Rotary, Kiwanis and Lions Clubs spoke in all the theaters and in many public meetings during the week preceding the election, advocating the ratification of the bond issue. The Chamber of Commerce committee cooperated with the city officials in effecting a complete organization in every voting precinct on election day to assist in getting out the vote. Augmenting this, the League of Women Voters had a voluntary organization of workers in every precinct. These workers were assisted by the automobile dealers and owners, who furnished

more than one hundred and fifty machines, which were used throughout the day until the polls closed. The organization in every respect was so complete that it was a physical impossibility for the opposition to have any effect. The ratification of the bond issue was the greatest achievement of its kind in the history of Wheeling, and authorized the largest amount of money ever devoted to a public improvement in any municipality in the state of West Virginia.

H. P. CORCORAN,
Manager, Wheeling Chamber of Commerce.

Education That Helps Boys to Plan Their Lives

NEW HAVEN, CONN.—Groups of high school boys are being taken on visits to the various industries of the city in order that they may be better informed as to the industrial opportunities offered, and the extent of the local manufactures.

After a meeting of representatives of the New Haven industries, a questionnaire was sent to each one of the industries to obtain information necessary to form an itinerary for the boys. The points covered in the questionnaire were as follows:

1. How large a group can you accommodate at one visit?
2. What time of the day do you prefer?
3. How long would you keep the boys?
4. Would you give a preliminary talk to the entire group of boys, explaining the high points of your industry and its products?
5. Would you be willing to prepare an outline which can be mimeographed by the Chamber of Commerce and given to each boy previous to the visit?

Note.—The preliminary talk to the boys and outline to be mimeographed may cover such points as:

- (a) Raw material and sources of supply
- (b) Products that are made and products that the group will see made
- (c) Methods of packing, marking and shipping
- (d) Market—where products are shipped to
- (e) Emphasis on advantages of education in securing advancement in the industry

The boys are asked to use the information they obtain on these visits in their school work, in the writing of themes, preparation of short talks in rhetorical work, etc. The educational authorities consider this experimental work of such value that they have decided to make it part of the regular class work next year.

It is expected that the "Know New Haven Industries" visits will promote a mutual understanding on the part of the industries and public school teachers and public school officials. The plan is based on the desire of industries to enlist

the interest and sympathy of prospective workers, and since the public school officials are interested in promoting the highest type of education, the cooperation between these two functions is most desirable.

It will help to educate the boys in the general knowledge of typical industries, thereby increasing their range of choice in making it possible for them to select the kind of work they like best after leaving school. A clearer idea will be given them of the opportunities in New Haven and this will make them want to stay in New Haven rather than go somewhere else. Emphasis will also be laid upon the fact that the longer a boy stays in school the greater is his opportunity for obtaining a good position.

W. PHILLIP SHATTS,
Assistant Secretary, New Haven Chamber of Commerce.

City Hall and Auditorium Combined Is Economical

NEWTON, KANS.—The Newton city auditorium well illustrates an admirable type of municipal building adequately serving the needs of the community, in which every local organization and interest can hold gatherings and where all the people can be entertained. Probably the greatest advantages to the community brought by such a building are the sense of common ownership and the civic and patriotic spirit that are developed through the better acquaintance and fellowship enjoyed.

The utility of this Newton building is shown by the freedom with which it is being used. During the year 1921 the auditorium has been used more than 200 evenings, as well as many afternoons. The auditorium proper seats 1,300 comfortably—384 in the balcony, and 916 on the first floor. It is well adapted for professional road shows, the stage being 65 by 23 feet, with five set scenes and a picture curtain.



CITY HALL AND AUDITORIUM, NEWTON, KANS.

There are eleven dressing-rooms, and shows with more than sixty people in the cast have been accommodated comfortably. These facilities have been the means of interesting a booking company and of bringing many good shows to Newton, although it is a much smaller city than any other on the same circuit.

The Newton city auditorium was erected through the efforts of the Chamber of Commerce in 1912 and 1913 at a cost of \$40,090. Bonds were issued bearing 4½ per cent interest, to be retired in 20 years. In addition to the auditorium, the building contains the city clerk's office, the city commissioner's offices and meeting-room, the city engineer's office, a rest room for women, the office of the city health nurse, the offices and store-rooms of Company F, 137th Infantry, the Chamber of Commerce office, the Harvey County Farm Bureau office, the rooms of the Boy Scouts and the American Legion, and a meeting-room seating 200 in connection with the Chamber of Commerce and Farm Bureau offices. Many meetings not large enough to require the use of the auditorium proper are held in this room. Many of the most progressive and forward-looking movements and accomplishments of the community have been launched in this assembly room, and it is used several times each week.

The average cost of equipping and maintaining the entire building over the past six years has been \$3,300 per year, and the income from rentals on the auditorium has been approximately \$1,500 per year, leaving an annual expenditure of \$1,800 from the city funds.

FRED BOWERS,
Secretary, Chamber of Commerce.

Ashtabula Finally Settles Street Car Question

ASHTABULA, OHIO.—After many uncertainties, the street car question in Ashtabula seems to have been settled. The question of purchasing the system first arose in April, 1920. At that time the Chamber of Commerce appointed a committee, which, after several weeks of careful investigation, reported unanimously in favor of the purchase of the existing system for the price of \$296,000.

The property of the street car system consisted of approximately six miles of single track with the necessary turn-out switches, etc., ten cars in a very bad state of repair,

and a car barn with the customary equipment, but no power-house, the power being purchased from other sources.

Following the report of the committee, the Chamber of Commerce began an active publicity campaign, as a result of which a special election called by the city stood 923 for and 905 against the bond issue, the very small vote being due to the fact that it was a special election. The provisions of the bond issue were that the bonds must be issued against the utility itself, and that the rate of fare to be charged must be such as to make the system self-supporting. Because of general market conditions the bonds could not be sold, therefore the deal was never closed. Immediately after the election the system went into the hands of receivers and has been in that condition ever since.

Shortly before the general election in November, 1921, an offer was made by the receivers to turn the property over to the city at the price of \$197,000. The Chamber of Commerce again appointed a committee to investigate the matter, which it did quite thoroughly, and the majority of the committee reported favorable for the purchase. But a referendum taken among the membership did not support the committee's report, and in the final election, November 8, the ordinance to purchase was overwhelmingly defeated. The vote stood 1,313 for and 3,303 against. It was rather difficult to explain just why there was this reversal of sentiment both of the Chamber and the community, except that the purchase at this time was to be an outright one, the bonds to be issued against the credit of the city. General business conditions and the attending unemployment made the necessity for adequate transportation very much less apparent at that time.

Not long after the election a meeting of the stockholders of the street railway line was held, and following this meeting an offer was made to the city to sell for \$150,000. On January 9, 1922, the newly elected City Council voted to purchase the car line at this new figure. A referendum was called for by a petition of those opposed to the purchase, and on April 24 at a special election the ordinance to purchase carried by a majority vote of 856. The complete vote was 2,164 for and 1,308 against. The Chamber of Commerce held forum meetings and



THE SPRINGFIELD CHAMBER OF COMMERCE FINANCED THE MAKING OF THIS ETCHING OF THE SPRINGFIELD MUNICIPAL GROUP

furnished speakers on the matter, and the purchase at that price was unanimously endorsed by the Directors of the Chamber.

The line will be taken over and operated by the local authorities as soon as the bonds can be issued and disposed of.

A. J. HORN,
Manager, Chamber of Commerce.

Chamber Procures Etching of Springfield Municipal Group for Publicity Purposes

SPRINGFIELD, MASS.—The commissioning of Louis Orr of Paris, a distinguished American painter-etcher, by the Springfield Chamber of Commerce, to make an etching of its famous Municipal Group had its origin in the desire of the Convention Bureau of the Chamber of Commerce for a picture of the group worthy of its recognized excellence, which it might use in showing Springfield's advantages as a convention city. It was first planned to secure an oil painting of the group, but this was found impractical.

The work of Mr. Orr was called to the

attention of the committee and a year ago he was invited to make the etching. This resulted in a contract with the artist by which he agreed to make a large etched plate of the group, from which are to be pulled fifty first state artist's proofs, each to be signed by the artist; the plate will then be destroyed. Of the fifty proofs, five are to be retained by the Convention Bureau for exhibition purposes and the remaining forty-five have been taken by private subscription at \$200 each, thereby financing the entire undertaking.

Mr. Orr came to Springfield last September and spent a month in making his preliminary drawing and detailed sketches. He returned to Paris in December and has been working steadily upon the Springfield plate. The first proof recently arrived in Springfield. The etching, which is 22½ by 39 inches and is said to be the largest copper plate ever etched, is reproduced herewith.

B. A. HAPGOOD,
Secretary, Springfield Chamber of Commerce.



Concrete pavement, Watervliet, N. Y., given hard, long-wearing surface by Hard-n-tyte Road Treatment.

—and when it comes to concrete road maintenance—read this book!



For over twenty years the General Chemical Company has been at the forefront of chemical research and manufacture in this country. Hard-n-tyte is the latest contribution of its splendid staff of chemists. It is the successful result of long search for a concrete hardener that really hardens the surface and materially increases its life. It enables engineers and contractors to deliver a quality of concrete work far in advance of anything that has been possible heretofore.

Weather-proof, wear-proof concrete is the easiest to maintain.

Hard-n-tyte is used not only for new work,—ask a few highway engineers who have tried it on old concrete pavements. Find out what state highway departments are doing to old work with Hard-n-tyte.

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General Chemical Company
40 Rector Street
New York

Hard-n-tyte Road Treatment

—makes concrete roads wear longer

Albany Chamber of Commerce Stages First Radio Meeting

ALBANY, N. Y.—Successful use has been made of the radio telephone by the Albany, N. Y., Chamber of Commerce in conducting what is believed to be the first radiophone chamber of commerce meeting held in the United States, and later in opening its membership expansion movement with an inspirational speech made by wireless from an airplane flying 2,500 feet above the city.

The first radio meeting was held April 12. More than 1,100 members and friends of the Chamber of Commerce gathered in beautiful Chancellors' Hall in Albany to hear the speakers, musicians and other participants in the program at the radio broadcasting station of the General Electric Company in Schenectady (WGY). The audience was therefore assembled about twenty miles from the performers. The program consisted of piano, violin and soprano solos, followed by a radio telephone speech delivered by Roy S. Smith, Executive Manager, Albany Chamber of Commerce.

A most interesting result of the meeting was the subsequent receipt of telegrams, letters and newspapers from scores of cities, some as far west as Terre Haute, Ind., indicating that the Chamber of Commerce speech and musical numbers had been clearly heard by thousands of persons. Among those who sent word that they enjoyed the entire program were many chamber of commerce groups in various cities, who having been previously notified of the program arranged, had scheduled their meetings and tuned their apparatus to receive and enjoy the program of the Albany meeting. Still another interesting reaction came from a number of Albany Chamber of Commerce members, who notified the President of the Albany Chamber the following day that they desired to be recorded "present," as, though they had remained at home the night before, they had heard and enjoyed the entire Chamber of Commerce meeting through their private radio sets.

In his address, "The Forces That Build Cities," Mr. Smith gave a short outline of chamber of commerce work, pointing out the great possibilities of using radio communication in chamber of commerce meetings, which hitherto have been limited to those who were

fortunate enough to be able to attend.

The membership expansion movement was inaugurated under most unusual conditions. On Wednesday, April 26, Lieutenant Maynard, the minister who won the coast-to-coast race and who is generally known as the "Flying Parson," flew from New York to Albany with the bride and groom he had married the day before in a Fokker plane over New York City. The plane was piloted by the famous aviator Bert Acosta. The machine was equipped with complete receiving and broadcasting wireless equipment to deliver speeches over the cities visited. At Albany the entire party were the guests of the Chamber of Commerce.

At noon the aviators took Mr. Smith for an airplane ride over the city, during which he broadcast the beginning of the expansion movement and in a radiophone speech, heard not only by every wireless equipment in Albany but within a radius of 200 miles, announced details of the movement and outlined the Chamber of Commerce program for the coming year. The event had been extensively advertised and thousands "listened in" on the ground; many were able not only to hear the speech but to see from their homes the huge machine circling over the city. At the conclusion of the speech the occupants of the plane were able to receive messages sent to them and to hear musical numbers not only from Albany but from as far away as Newark, N. J.

This agency makes possible broadcasting to the citizens of the surrounding country, as well as to the stay-at-homes, the inspiring message of chamber of commerce speeches, and the educational possibilities of such community gatherings are thereby vastly increased.

W. E. BACON,
Assistant Manager, Albany Chamber of Commerce.

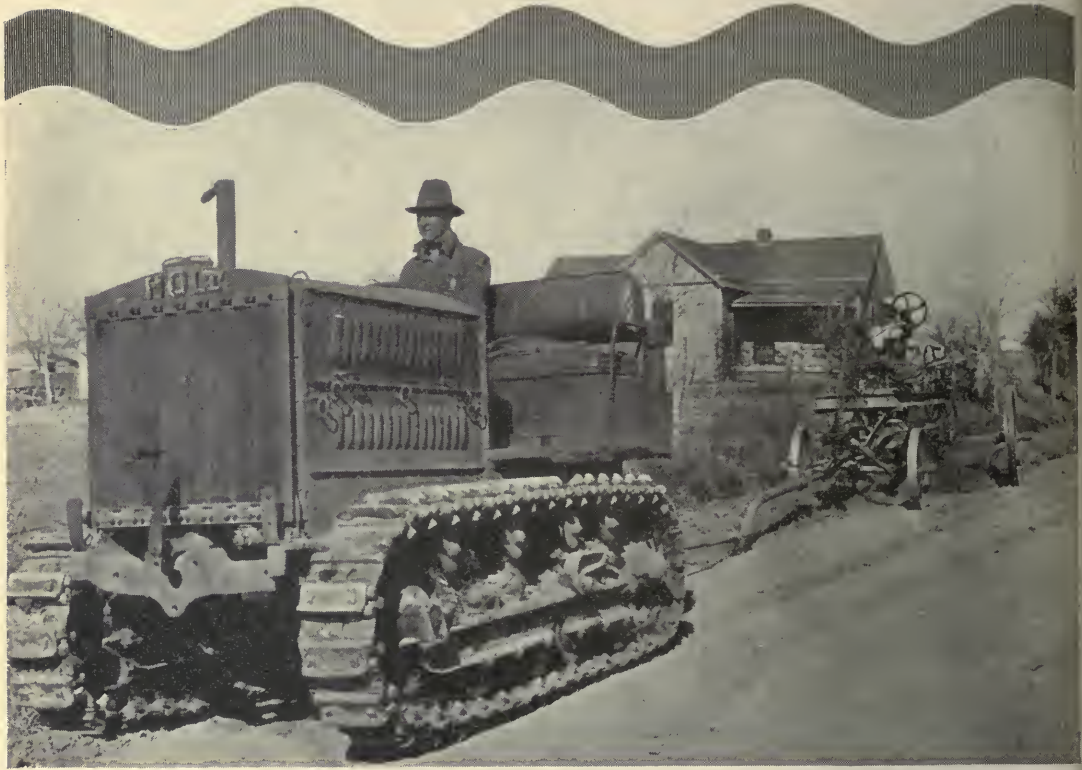
EDITORIAL NOTE.—The Albany claim for the honor of conducting the first chamber of commerce meeting by radio rests on the following record:

April 12.—Albany Chamber of Commerce meeting in Chancellors' Hall; musical program and speech by Roy S. Smith, Executive Manager.

April 21.—Brooklyn, N. Y., Chamber of Commerce, addressed by H. V. Kaltenborn, Associate Editor of the *Brooklyn Eagle*, from the Westinghouse broadcasting station, Newark, N. J.

April 26.—Albany, N. Y., radio speech by aeroplane to Albany Chamber of Commerce, Roy S. Smith, speaker.

April 24.—Clipping from the *Pittsburgh Gazette-Times* indicating that the Pittsburgh Chamber of Commerce members on their Golden Rule tour were welcomed in Toledo, the following week; by a radio program broadcast from Fort Wayne, Toledo, Cleveland and Pittsburgh.



Read This Street Superintendent's Report

The "Caterpillar's"* field of usefulness is by no means limited to road making. There is a "Caterpillar"* of size and capacity for every power need. For snow removal, hauling garbage disposal trains and other civic work—wherever power and endurance is at a premium, the "Caterpillar"* has no real competitor.

W. W. Jones, Superintendent of Streets, Memphis, Tenn., says: "We have had splendid work and satisfaction with our "Caterpillar,"* crowding it to the limit and working constantly. In three months, sixty-five streets, which had been almost impassable, were graded and surfaced a total of over thirty miles. On ordinary dirt roads we cut ditches and surfaced about one mile per day, but this is good work considering narrow streets, many not over thirty feet wide, with sewers, water pipes, hundreds of plank crossings, short runs and contracted corners. We can do this work at about one-fifth the cost of teams and hand labor. Our service has been excellent at all times. We expected this from Holt, and we are not disappointed."

**There is but one "Caterpillar"—Holt builds it*

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PEORIA, ILL.
STOCKTON, CALIF.

How Rotary Works

By Chesley R. Perry

Secretary General, International Association of Rotary Clubs

FOR the readers of THE AMERICAN CITY who may not be familiar with the Rotary Clubs that are now being formed in our most progressive cities, let me start with a thumb-nail sketch of Rotary's purpose and growth.

Founded February 23, 1905, in Chicago by a lawyer who was lonesome and who wished to know his fellows better, Rotary grew from one club to three, then a hundred, and now claims eighty thousand members in nearly twelve hundred clubs scattered through twenty-five separate nations. One of the early clubs, in a city in which three or four civic organizations fought among themselves and neglected civic leadership, saw the need for community action and took it. After the storm of protest that ensued, this club stated its position. Rotary would interfere with no recognized organization, but it would make its own those tasks which others seemed indifferent to, or incapable of doing. Thus Rotary's public service began.

Another function which soon evolved was the formulation of codes of business ethics. Under the Rotary scheme of organization there is but one representative of each line of business in a club; thus each member became an ambassador to his business associates, and when the need for a statement of business ethics became apparent, Rotary met it, as the organization most truly representative of all business. Rotary soon recognized that he profits most who serves best, and this—simply another statement of the Golden Rule—became Rotary's creed.

To maintain a working membership, Rotary developed the idea of compulsory attendance at meetings: any member failing to attend four consecutive meetings except for illness or absence from the city is automatically dropped.

The manner in which the Rotary principles are put to work is naturally varied with the needs and conditions of the community. It is the ideal of the Rotarian

to have his club so regarded in a community that its interest and influence in community affairs are assumed as a matter of course by the citizens generally; that whenever a Rotarian is selected to participate in any community activity, the sincerity of his work and the single purpose of his motives will be understood or assumed as needing no further explanation or proof; that a jury of Rotarians can be depended upon to give a fair trial to any sort of offender and help administer justice or execute the law in a way that is calculated to best serve the needs of the community. That is the way in which the Rotarian wishes his club to be regarded, and it is the mark for which he aims.

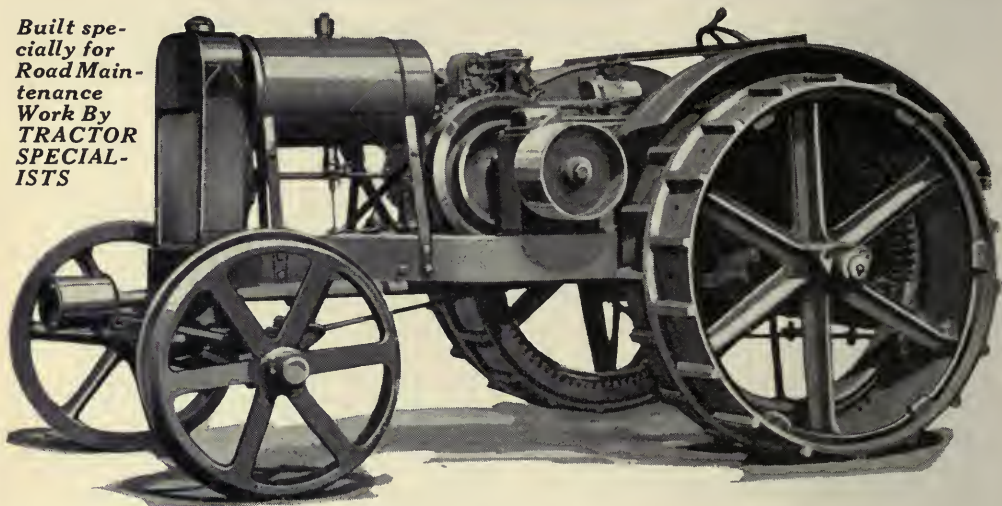
Rotary as a unit, throughout those countries where the laws provide for jury duty by citizens, insists that its membership shall assume its full measure of jury duty. Further than that, it insists that these members shall urge their employees as a part of the responsibilities of citizenship to accept jury duty and to serve faithfully.

Rotary Backs Up the Chamber of Commerce and Other Civic Bodies

In some Rotary clubs it is compulsory for an applicant for membership to be a member of the chamber of commerce in his city or of the civic body that is equivalent to the chamber of commerce in other cities. The clubs as a whole encourage membership in such civic bodies, and some of the literature published by International Rotary has direct argument as to why a Rotarian should also be a member of other civic organizations.

In civic movements of importance, the Rotary Club will always be found in the forefront of progressive thought and action. When one club has performed a service that seems to be of importance and is applicable to other communities, the International Headquarters usually publishes a resumé of what has been done, in *The Rotarian*, the official organ of Rotary, or in the *Weekly Letter*, a weekly bulletin that goes to all clubs,

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Flesh and blood has never been able to compete with mechanical power. Why attempt it now?

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Make the Hart-Parr Road Maintenance Tractor supreme in road work.

TWENTY-ONE years of Tractor Specialist Experience has built this tractor simple in design so that it does not need an engineer or expert to operate and service it.

SIXTEEN YEARS proven work in building Kerosene Tractors only has made us supreme in the field of fuel economy—thus cutting your operating expense in half.

TWENTY YEARS of continuous operation by our first tractors in the hands of their satisfied owners is proof of Hart-Parr durability and ability to deliver power under practically all conditions.

Hart-Parr Tractor Power has built thousands of miles of railways and highways. It is not an experiment. It is a proven fact.

Catalogue and record of performance will be mailed to interested persons on request.

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Work for Boys and Girls

One of the big accomplishments of Rotary is what it calls the "back-to-school movement." This was initiated by the Rotary Club of Blackwell, Okla., three years ago. The members of the club learned that some of the boys and girls who had completed the elementary and secondary courses in the public schools were not planning to go to the high schools. The Rotarians sought out these pupils and learned the reasons. They then set about correcting conditions and eliminating the reasons, and persuaded most of these boys and girls to continue their education. Some of the pupils were being forced to quit school for economic reasons. Jobs were found for these that enabled them to continue in school. In some cases where the parents thought the pupils had received education enough, the Rotarians interviewed the parents and proved to them that the boys and girls ought not to give up. In one way or another, most of the boys and girls went back to school.

A statement of what had been done was published in due course, and now the "back-to-school movement" is a regular part of the work of many Rotary Clubs every year—as much so as the election of officers or the annual convention. Last year it is estimated that this movement was responsible for the return of 25,000 boys and girls to school.

For two or three years past a very important place has been given in several of the large cities to what is called "Boys' Week." New York, Chicago, and Kansas City, particularly, have staged celebrations that attracted nation-wide attention. This is a Rotary movement of a different sort from the "back-to-school" idea. In this case a non-Rotarian conceived the idea of a "Boys' Week" celebration and he turned to the Rotary Club of New York City to bring about the realization of the idea. Fifty thousand boys participated in the parade that was held on one of the days during the week. Each day has its special significance, beginning with Sunday as a "Boys' Day in the Church"; then Monday, "Boys' Parade Day"; Tuesday, "Boys' Day in the Schools"; Wednesday, "Boys' Day in Industry"; Thursday, "Boys' Day for Health and Safety"; Friday, "Boys' Day

for Thrift and Citizenship"; and Saturday, "Boys' Day with Dad and At Home." This year more than 150 cities are celebrating Boys' Week. And in towns where there is no Rotary Club to get behind the movement, the American Legion is carrying it on.

Rotary's connection with Boys' Week is temporary. It is a part of its very active interest in what it calls "Boys' Work," a regular feature of all club work. The organization is demonstrating that it believes in a Boys' Week and is showing the communities the value of the Boys' Week, to the end that an appropriate organization may be formed to carry it on.

Public, Not Political Service

Rotary does not take any part in political campaigns; naturally, an organization of its character could not be expected to participate in such campaigns or have any part in political discussions. But Rotary believes in good citizenship and urges its members to vote. In San Francisco some years ago the club started a movement to bring out every voter in the city to the polls at an election. It announced frankly that it was not in the least concerned as to how the citizen voted after he reached the polls. But it sought by every possible means to impress on the citizens of San Francisco the fact that voting was the main duty of each man and woman on election day, and that the man or woman who did not vote was not only shirking the responsibilities of citizenship, but was also making it impossible for him or her ever to complain about bad city government. This work of the San Francisco Club has developed a healthy sentiment in San Francisco toward the ideal of good citizenship. The club was, of course, criticized severely by political factions. But it has continued on its way.

Practically every Rotary club in the British Isles—and there are more than eighty clubs in that section of the world—has either initiated or been a most important factor in the campaigns throughout the United Kingdom to find "Jobs for Demobs," as the movement to get work for the discharged soldiers and sailors is called. This movement has met with considerable success, and much time of Rotarians has been devoted to it.



Consider Well the Question of Health

The public drinking cup is forbidden by law in many states—because it is a menace to the public health.

MUELLER Sanitary Drinking Fountains

comply with the law—insure freedom from contagion—are absolutely sanitary and hygienic—are practically fool-proof and require no attention.

No. E-3705 here shown is one of many models—in both Wall and Pedestal patterns—all of the bubbling type—all of **MUELLER** standard construction.

Descriptions and prices on request.

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Sarnia, Ontario, Canada

Mueller Metals Co., Port Huron, Mich., Makers of "Red Tip" Brass Rod; Brass and Copper Tubing; Forgings and Castings in Brass, Bronze and Aluminum; Die Castings in White Metal and Aluminum; also Screw Machined Products.

The prosperity poster campaign of the Rotary Club of New York, carried on during the current year, resulted in displaying optimistic posters on 80,000 bill-boards in every section of the United States and Canada. Many Rotary Clubs in various parts of the country assisted in financing the campaign, but it was undertaken by the New York Rotary Club alone, and two-thirds of the total cost was borne by members of this club. The posters themselves simply carried the signature, "Rotary Club Members."

One entire issue of this magazine could be filled with brief paragraphs of this sort from every section of the world regarding the activities of Rotary, despite the fact that fully 80 per cent of the things that Rotary has actually done to promote or initiate civic movements will never be known, because of the idea of the organization that unselfish service means service without the attendance of brass-band methods.

The various clubs in the state of Ohio, for instance, are the initiators of a work in caring for crippled children in the state. This has become a state-wide activity in which all sorts of organizations and civic bodies have taken part, the Toledo Rotary Club being credited with originating the idea. In Erie, Pa., the Rotary Club maintained a paid visiting housekeeper to teach the housewives of the community home economics; the McAlester, Okla., Rotary Club initiated the movement to create public sentiment demanding the construction

of better public highways; the San José, Calif., Rotary Club inaugurated a movement for street signs; the Minneapolis Rotary Club, assisted by the other clubs in the state of Minnesota, obtained the enactment of legislation for better school facilities for crippled children; the Superior, Wis., Rotary Club provided the means for the establishment of a dental clinic in the schools of the city; the Denver, Colo., Rotary Club was the main factor in the work of securing the famous municipal organ that is now installed in the city auditorium; the Winnipeg, Man., Rotary Club raised the funds for a Boys' Home; the Los Angeles Rotary Club initiated the movement for a public health clinic—the list could be indefinitely extended.

The main idea of a Rotary Club is to make itself useful, not to acquire merit for itself. It is the desire of Rotarians that all organizations engaged in civic work should know the Rotary Club as a backer of every worthy civic enterprise, as desiring to push forward any worthy movement, and as being in the front rank when support for such enterprises is needed—but as being in the ranks. No Rotary Club seeks to gain credit for enterprises of a civic nature. Rather, even when it initiates a big Rotary movement and another organization takes charge of the enterprise, or is developed to carry it through, it desires that the whole credit for the success of the enterprise should be given to the organization that fathers it.

National School Announcement Draws Many Inquiries

GREAT interest in the second session of the National School for Commercial Secretaries, to be held at Northwestern University, Evanston, Ill., August 21 to September 2, 1922, is indicated in the flood of inquiries which poured into the office of Chairman Robert B. Beach of the Board of Managers of the School immediately following the mailing of the formal announcement and invitation.

Two courses are planned for this year, one for experienced secretaries and those who attended the first session, and one for men and women not now engaged in the profession who desire to prepare themselves for chamber of commerce work. Many of

the leading men of the secretarial profession have already indicated their intention of attending the School, recognizing its value in keeping them informed of the latest developments affecting their work, and as a means of receiving a fresh inspiration for the tasks and problems of the coming year.

The tuition rate will be \$30. Good board and comfortable rooms may be obtained for \$2.50 to \$2.75 per day. There will be special accommodations for women students, and one building has been set aside for secretaries accompanied by their wives.

Application forms may be secured from Robert B. Beach, Business Manager, Chicago Association of Commerce.

THE AMERICAN CITY



Harvester Road, St. Charles, Mo.
"Tarvia-X," 1920



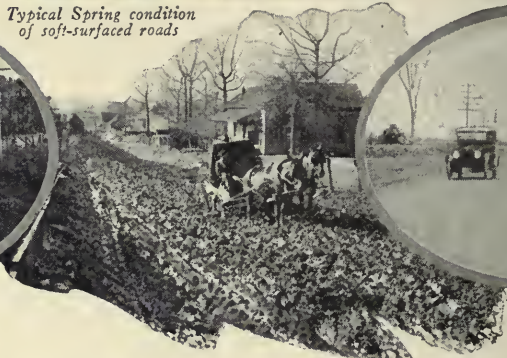
Typical Spring condition
of soft-surfaced roads



Carthage-Antwerp Road, N. Y.
Another Tarvia Highway



Glastonbury-Hartford Road,
Glastonbury, Conn. "Tarvia-X," 1915



State Road at Kittery, Me.
"Tarvia-X," 1912

Tarvia transforms old-fashioned mud roads into all-year mudless, dustless highways---

PRESIDENT HARDING recently declared that the problem of distribution "is one of the greatest economic problems, if not the greatest problem, of modern civilization."

When we realize that it costs from four to ten times as much to haul a ton of goods over bad roads as it does over good roads, we see at once how vital this road problem is to all of us.

The question no longer should be, "Shall we have good roads?" It should be, instead, "How quickly and how cheaply can we get good roads?"

The Road Commissioners of hundreds of towns and rural districts throughout the country have found from experience that Tarvia pavements are the most economical good roads it is possible to build.

In first cost a Tarvia road is only slightly more than plain waterbound macadam. The upkeep of Tarvia pavement is, all things considered, so much less than that of any other type of lasting road that the saving—over a short period of years—will offset the original cost of construction.

Properly looked after, there is no limit to the life of a Tarvia road. With regular but inexpensive maintenance, it is actually improved by time and traffic. Its easy-traction surface is smooth, firm, dustless and mudless all the year round—year after year.

Illustrated booklets free on request

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The Law Covering Trespass on Abutting Land in Highway Construction

By A. L. H. Street

A HIGHWAY engineer in Ohio asks for a citation to court decisions on the question whether an abutting landowner has legal recourse against grading a street in such manner that an embankment spreads to the adjoining property. The question is specially applied to cases where the surface of the street is graded full width, permitting the dirt to form a natural slope extending upon such property, which has been improved without regard to the established grade or remains unimproved. Must the city build a retaining wall, or does it devolve upon the abutter to protect himself if he does not desire the dirt to spill over upon his land?

An examination of the law reports shows that the general rule established by court decision is that there is no right to commit such a trespass upon private property. A city has no more right to occupy private property in this way than it has to encroach upon such property to widen the surface of a street. In either case, the right to occupy the abutting property must be acquired by purchase or condemnation. We refer below to a few of the leading cases on the subject.

In the case of *Bunker vs. City of Hudson*, 99 Northwestern Reporter, 448, the Wisconsin Supreme Court said:

"Both allegation and proof are undisputed that the Council ordered Third Street graded to established grade by the Street Commissioner, within whose charter functions such work fell; that he did that work so as to bring the surface of the street to grade for its full width, whereby, of course, the foot of the grade necessarily extended onto adjoining premises in absence of any retaining wall or other precaution. It is difficult to conceive a plainer case for corporate liability. In grading the street the city was doing one of the things which, as a municipal corporation, it was authorized to do. That work was done in an improper or negligent manner, so as to invade the rights of the plaintiffs, not as members of the public, but as adjoining proprietors. Toward them the city's act was not governmental, but proprietary. For approximate damage thus caused, liability results according to principle, and without conflict of authority. . . . Counsel for appellant seeks to escape this result by urging

that the city did not place this earth upon plaintiffs' premises, but that such act was done by the Street Commissioner unlawfully, and thus as an individual. Doubtless it is true that neither the charter conferring powers on the Commissioner nor the resolution of the Council requiring him to grade Third Street expressly authorized him to cast a shovelful of earth on plaintiffs' lot, but both conferred on him general authority to do the work of grading, and in the good-faith performance of that work he was the corporation in action. What he did, the city did. Express authority to do the specific unlawful act is by no means essential. It suffices that such act occurs in the course and as a part of the good-faith performance of an authority to act for the city upon a general subject."

The subject was considered by the Oregon Supreme Court in *Reiss vs. City of Portland*, 141 Pacific Reporter, 167, where the Court said that "the city had no right to pile earth and other material upon the abutting owners' lands, and that, if this was done without their consent, it was a trespass, for which the landowners could recover damages." Citing several decisions from courts of other states, the Oregon Court adds:

"In this case it is claimed that the city made a fill the full width of the street, and made a slope extending onto the lands of the abutting owners. We hold that the city had no right to do this without the consent of the owners. However, it is probable that the city could have obtained a right to use the property of the abutting owners by proper proceedings and paying for it."

In *Moore vs. Albany*, 98 New York Reports 406, 407, the New York Court of Appeals said:

"In grading a street it seems clear to us that the public authorities have no right to invade private property outside of the street lines. If it becomes necessary to use or interfere with such property, they must in some way acquire the right to do so. . . . In order to grade the street to the full width thereof, it was necessary either to build retaining walls on the sides of the street within the street lines, or to support the street by sloping embankments upon the adjoining lands. It is evident that the latter mode was the most reasonable and economical. The lands outside of the street lines . . . remain in the possession and occupancy of the owners thereof, subject to the



Birmingham's Record

Nine 1920 Harley-Davidsons served Birmingham, Alabama, so well that today a fleet of 20 new machines polices this progressive southern city.

The Motorcycle Officers' Monthly Report shown at the right tells how successful the Harley-Davidson squad was during February. *Total arrests, 723; total fines, \$5,962.00!*

Increased efficiency is the big reason why 847 cities and counties are using Harley-Davidsons for police work. The increased revenue to the city, though important, is incidental. For chasing automobile speeders, running down "motorized crooks", enforcing parking and traffic rules, for emergency calls

and a variety of service duties—a Harley-Davidson is ideal.

Cost? 50 miles for a dollar (gas, oil, tires and all) is the average upkeep expense of the Harley - Davidson, "America's Police Motorcycle"!

How about your city? Let us send you special, illustrated literature FREE, showing what other cities are doing with motorcycles. No obligation to you. Or ask your dealer for free demonstration.

HARLEY-DAVIDSON MOTOR CO.,

Milwaukee, Wisconsin

Harley-Davidson

World's Champion Motorcycle

MOTORCYCLE OFFICERS' MONTHLY REPORT

Birmingham, Ala., March 1 1922

MR. F. H. McDUFF,
Chief of Police:

We respectfully submit the following report of work performed February 1922

Total Number of Arrests	723
Total Number of Acquittals	28
Cases Not Prosecuted	57
Cases Pending	45
Total amount of fines and sentences imposed in Recorder's Courts:	
Amount of Fines	\$5,962.00
Amount of Sentences	4 years and 93 days.

burden of the earth cast thereon. These embankments are evidently not injurious to the adjoining owners, as it is for their interest to have their lands filled up to the grade of the street. It cannot be presumed that they will dig away and remove these embankments, and, if they should, the street would still remain, and the city could support its sides in some other way. The only practical remedy for the owner of the lands thus invaded is to sue the city or those who placed the earth upon his lands without his consent, express or implied, for the wrong, and in such an action he can recover his entire damage for a permanent appropriation of his land for the embankment. . . . They could, if they had desired, have restrained the deposit of earth upon their lands by an equitable action."

The decision of the Oregon Supreme Court in the case of *Giaconi vs. City of Astoria*, 118 Pacific Reporter, 180, goes a step farther by holding that even where a street embankment is constructed wholly within the limits of the street lines, the city

will be liable for invasion of lower abutting property, caused by subsidence of the embankment, if that be caused by a defect in the construction plan, as by failing to provide a proper foundation, thereby naturally exposing the embankment to subsidence. In such case, it is further decided, the city cannot avoid liability on the ground that the work was done by an independent contractor. The Court says:

"The standard of care to be observed by the city in such cases is such that a reasonable and careful man in like circumstances would use, if the responsibility for damages rested upon him. All would most likely agree that a wide and level pedregal would be a safe foundation for a fill of the character and dimensions described in the city ordinance. None would probably contend that a steep declivity of shifting sand would be suitable for that purpose. But between these extremes the question is one of fact, which must be decided by the jury or court."

Insect Pests Must Be Considered in City Planning and Planting.

By W. Dwight Pierce, Ph. D.
Consulting Entomologist, San Mateo, Calif.

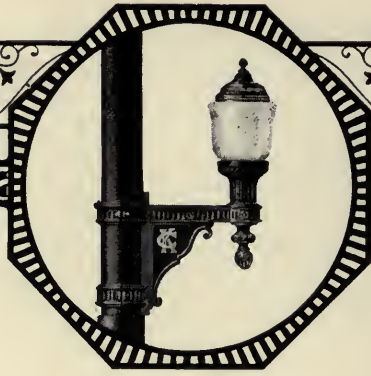
IN laying out new suburbs, planning parks and parkings, great care must be given in the selection of the trees and shrubs to be used, not only from the standpoint of landscape, but also from the standpoint of immunity to attack from insects and disease. Some trees are far more susceptible to attack than others. In the city of Washington on the Agricultural Department grounds there is an avenue of Japanese maidenhair or ginkgo trees, presented many years ago by the Japanese Government. From these trees many other streets have been planted to this species, and yet no insect has ever been recorded as attacking them, and they are comparatively immune from disease. This tree is beautiful in form and makes a good shade tree.

Another pretty shade tree which can be grown in many parts of the country is the tulip poplar. It is also remarkably free from insect pests. Standing next to these in the Eastern States are the red and scarlet oaks and the plane or sycamore trees, also known as button-ball. In California

and the Southwest the eucalyptus and pepper trees are becoming quite popular. In the Southeast the live-oak is a good, sturdy tree not easily injured.

Many of the trees we love so much to see, as the elm, the locust, the poplars and maples, are very susceptible to insect attack, and where they are commonly planted considerable entomological control work is absolutely necessary.

Ambassador Bryce in an article on Washington called attention to the plan of planting a certain type of tree on a certain street for its entire length, and another kind on the next street. Thus the observant one in Washington will recognize avenues of hard maple, Norway maple, elm cottonwood, poplar, oak, maidenhair, tulip poplar, locust and many other fine trees. If an insect pest appears and ravages certain trees, it is certain that most of the other species of trees will be immune from this particular pest, for there are not many kinds of insects which attack numerous kinds of vegetation, and none which attack all types.



In Greater Kansas City

The Streets are illuminated with General Electric
Fixtures supported by King ornamental cast iron
trolley pole brackets.



King Manufacturing Co.
Monadnock Building, Chicago, Ill.

Parkways Should Have Protected Trees

All trees planted along streets and parkways where there is danger of artificial abrasion or gnawing by horses, should be protected by some kind of wooden or metal guards, which must themselves be harmless to the tree. A large part of the injury by borers and diseases starts at points of injury, such as broken limbs, gnawed and scratched places, etc. If the city watches its trees carefully, removes all dead wood and treats the scars with a coat of white lead paint or of asphaltum, insect injury will be reduced. Some species may be controlled by pruning the infested branches during the summer before the larvae have gone too far.

Badly Infested Trees Should Be Removed

There are many types of borers which we have never learned to control, once they get a start in a tree, because of the impossibility of getting killing agents to reach them. Often sentiment causes a city or a householder to cling to a certain tree which is slowly dying from internal attack, when common sense dictates that this tree should be cut down and destroyed to prevent the spread of the pest to other trees in the vicinity.

Careless Pruning and Trimming Is Dangerous

A trained expert should be in charge of the pruning, trimming and care of the city's trees. By careful and judicious pruning much insect injury can be removed and prevented. The scar made by pruning should always be painted to prevent attack by boring insects, and fungous diseases. In fact, when a diseased limb is sawed off, the spores are likely to adhere to the saw, and infest the next limb sawed. An expert would disinfect his tools before proceeding.

Proper Tree Surgery Is Often Effective

Certain types of disease and injury by insects can be cut out, and the fresh uninfested wood disinfected and protected. Trees in almost the last stages of decay can sometimes be saved by surgery and the wound then filled in so that normal growth may proceed. Men who are not properly trained may do more harm than good by their surgery. They must know how to provide for

expansion and contraction of the cement, overgrowth of the bark, anchorage of heavy branches to prevent splitting, and many other technical points of great importance.

Many Trees Need to Be Sprayed

Spraying of trees with insecticides and fungicides is often necessary, but is worse than useless unless directed by an expert who knows what spray to use and when to use it. Some sprays are designed to kill by contact and are used against sucking bugs, while other sprays are stomach poisons and kill when eaten. Kerosene emulsion and nicotine sprays are used against lice, some scales and certain sucking bugs. Arsenicals are most frequently used as stomach poisons. In the case of certain scale insects, fumigation only is effective, but this is not often practised in cities because of the dangerous gases used. Poisons in the form of impalpable dust are rapidly supplanting liquid sprays in many of our pest problems.

None of Our Pests Are Nation-Wide

I have carefully refrained from citing particular species of shade tree pests in the latter part of this article, because to do so would be confusing. There are multitudes of them, requiring volumes to describe. Our country is large and has many different types of climate, and no species of shade tree occurs throughout the country. The particular pests of your city may require separate study before control can be effected, or it may be that work has been done elsewhere which will give your city scientists the basis for their work.

Make Your City Beautiful

It is the duty of city managers to make their cities beautiful and homelike. Proper use of trees and proper care of them after they are planted will contribute more than any thing else you can do to add to the beauty of your streets. Don't permit signs to be fastened to any tree in the city, for they not only mar the beauty of the tree but also injure the tree itself, giving entrance and shelter to pests.

It is the duty of the city official to protect the magnificent shade trees along the way. Use your influence to protect all trees from the sign-board pest that ruins both trees and scenery.

HOLLOWSPUN

Lighting Standards

THE appearance of the business district of Miami, Oklahoma, was greatly enhanced by these Hollowspun reinforced concrete trolley poles. The railway company also benefited through the elimination of pole maintenance. Lighting standards, trolley poles and a combination of the two are all described in Catalog Supplement No. 9.

Massey Concrete Products Corporation
Peoples Gas Building Chicago



An Avenue of Roses

By Florence Holmes

Bureau of Parks, Portland, Ore.

AS characteristic as the hawthorn hedgerows of England, the cherry-blossom ways of Japan and the stately palm avenues of California is the four-mile rose avenue of Portland, Ore., now in the making. A similar street is shown on the cover of this issue. The lovely Caroline Testout and the dainty Dorothy Perkins are the beauties of the rose world which make Portland's rose boulevard a highroad of charm in June.

Early in January, 1920, the Portland Ad Club put before the public the proposition of a roseway along four miles of the Sandy Boulevard, the connecting link between the city and the famous Columbia River Highway. Civic clubs and city officials interested themselves in the project, and the plans for the rose-bowered avenue are now being realized. The nursery force of the Bureau of Parks set out 21,000 Caroline Testouts and 4,500 Dorothy Perkins cuttings to be used on the roseway, and others are to be grown by organizations and individuals at various times.

The choice of the Caroline Testout has been the outgrowth of a gradual increase in the use of this profuse bloomer. Portland has held an annual rose show in June every year since 1889, and in all these years the rose growers of the city have been endeavoring to produce a rose that will qualify as the official rose of Portland. In 1908 the Rose Festival, supplementing the rose show, was instituted and held in June, the gala time of the City of Roses. The official Portland rose has not yet been developed, but in lieu thereof, by common consent, the Caroline Testout has been serving.

The roseway is the culmination of many plans and of much interest in Portland's peculiar adaptability to rose growing. The name "Rose City" was first given to the city 25 years ago by the Presbyterian General Assembly, which was in session here. Later, in 1905, at the Lewis and Clark Ex-

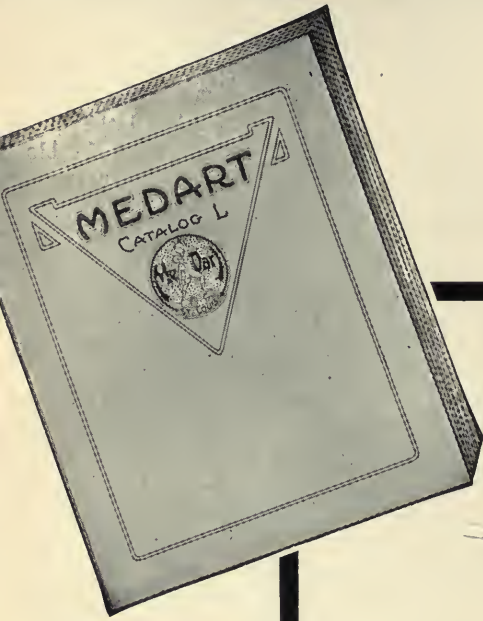
position, the rose was declared the queen of flowers and great bouquets of the blossoms were presented to the women visitors at the fair on certain days. The interest in rose culture was continued, being sponsored by the Portland Rose Society and other organizations and by individual residents. "Plant a Rose" posters were pasted on automobile windshields two years ago to further the rose idea.

Rose enthusiasts in all parts of the country took a new interest in Portland when the International Rose Test Garden was established in Washington Park in 1917. This was made an official test garden of the American Rose Society, and new roses from all parts of the United States and Europe were entered in the testing plats. At the June Rose Festival awards are made for the finest blooms of the season. All species entered in the Test Garden are new and unexploited commercially. The Rose Test Garden is a unit of the large decorative rose garden now being built in Washington Park, where eventually there will be botanical collections, historical gardens and other features incorporated in one comprehensive design.

The Sandy Boulevard, which has been set aside as the Avenue of Roses, is a broad, straight road of few grades, running diagonally through a residence section of the city into an attractive rural section of fields and woods, until it joins the eastern division of the scenic Columbia River Highway. The roseway will be a fitting approach to the majestic river highway as well as a striking feature of the Rose City, when it is completed.

Under the direction of C. P. Keyser, Superintendent of the Bureau of Parks, the parkings were surveyed and the ground prepared for planting last fall. More than three thousand roses were set out at that time and many will be added this fall when the planting season opens.

A park is a growing asset to a growing city—more beauty, more comfort, more people, more value.



The
**Recognized
Textbook on
Playground
Planning---**

This 128-Page Medart Catalog is recognized everywhere as a text-book on Playground Planning and Installations. It shows in detail just what apparatus is best suited for boys, for girls and for smaller children. It shows ideal playground layouts, where cost is secondary to service and it shows, too, what combinations are most desirable for smaller communities or centers where only a limited appropriation is available.

And, of course, it points out convincingly just why you should always specify Medart Playground Equipment.

Add this elaborate book to your library— it is an actual help to anyone interested in Playgrounds and Playground Planning. Sent promptly on request.

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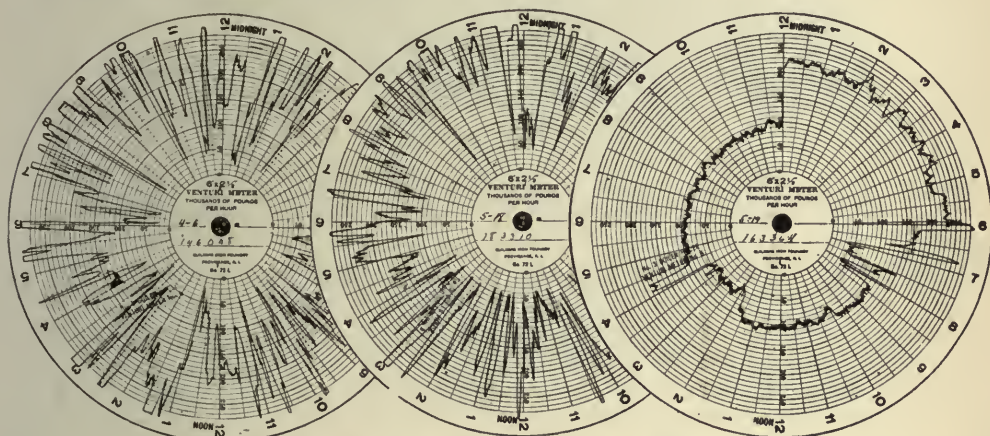
Selecting a Boiler-Feed Regulator for the Municipal Power-Plant*

By W. F. Schaphorst, M. E.

INEFFICIENT hand regulation of boiler feed is still practiced in many large and many small power-plants in all fields. The writer witnessed the installation of a new 500-horse-power water-tube boiler in a municipal power-plant about a year ago and inquired concerning the kind of feed-water regulation that would be employed. The engineer replied, "Hand regulation. I guess it is as good as any other kind."

His guess was incorrect. Much money

too high or too low. Then the valve is either completely closed or completely opened, and is left in that position until the water is again too low or too high: The water may be too low just at a time when additional boiler capacity is required. The feed valves being open at the same time means that the fires must be forced to a far greater extent than should be necessary, and this means that a large amount of heat is lost.



THE VALUE OF REGULATING BOILER OPERATION

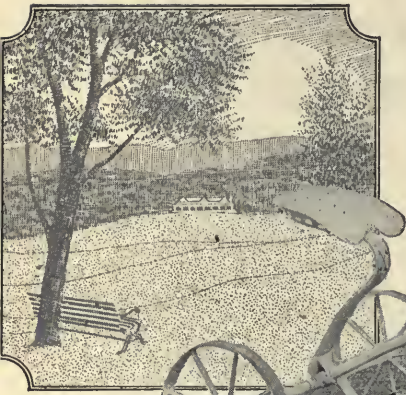
The two left-hand charts show inefficient hand regulation; the right-hand chart shows the effect of modern regulation on the same boilers

can be saved yearly by adopting good mechanical regulation. Important savings result from several sources. It is a mistake to believe that the labor is the only saving. There are other economies of much greater magnitude.

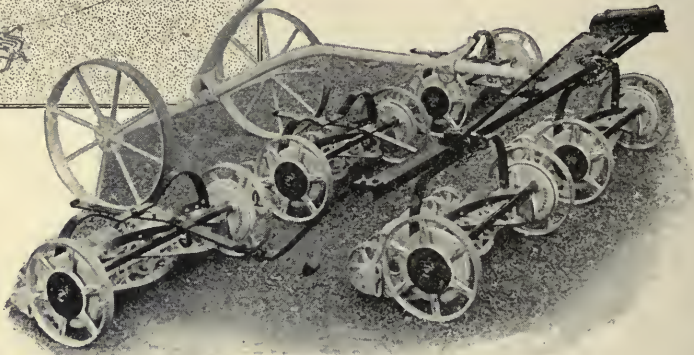
Two methods of boiler-feed regulation are in use to-day—hand and automatic regulation. In the smaller plants where feed water is controlled by hand, this is usually taken care of by the fireman. The fireman, however, has many duties, and cannot give to the regulation of feed water the time that is necessary to insure satisfactory results. The result is that the water input is not changed until the water-level becomes either

In the larger power-plants a water tender is often employed whose duty it is to take care of the input of water to a number of boilers. If he is taking care of, say, eight boilers, each boiler can receive only 12.5 per cent of his time, and this is sometimes cut down to 8 or 10 per cent because of losses, time consumed in walking between boilers, etc. Starting with No. 1 boiler, the feed valve is opened because the water-level is too low, not because of a change in output. By the time he gets around to No. 1 boiler again the water may be too high or too low, and an adjustment is again made, not in any relation whatever to output or efficiency, but purely in relation to the level of the water.

*Copyright, 1922, by W. F. Schaphorst.



Coldwell Lawn Mowers



An Exceedingly Flexible Mower With a Considerable Appetite for Work

The Imperial Gang Mower, designed to fit the especial needs of cost-considerate park officials, effectively accomplishes the cutting of spacious lawns at an employment of the minimum amount of time and expenditure.

Suited admirably to the strength and greater speed of the lighter type of utility horse (as compared to the slothful ambles of the cumbersome draft horse) this combination of five 20-inch Imperial Hand Mowers cuts an immaculate swath 91 inches wide across the surface of a level—or hilly—lawn in rapid style.

Over the triple gang mowers of the side-wheel type, The Imperial Gang Mower has demonstrated its superiority under actual conditions on all kinds of tasks, and on all public grounds where it has superseded the narrower type, the comparison has proved a feature of saving, with better work, in favor of the Imperial.

After all, it IS a Coldwell Lawn Mower, and with 57 years of constant effort forward as an heritage, *it should be* a marked and cost-conserving mower.

By the way, that 57 years of “knowing-how” has taught us many things about lawns—a fund of knowledge—yours for the asking.

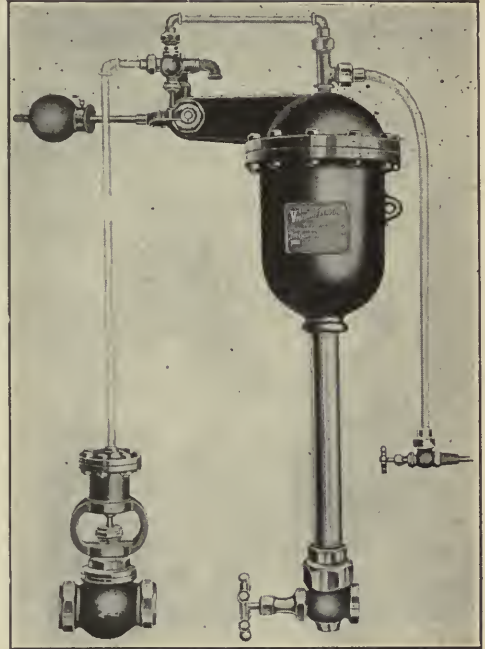
COLDWELL LAWN MOWER CO.
NEWBURGH, N.Y., U.S.A.

Some power-plant engineers may say, "My load is absolutely constant, and therefore hand feed is perfectly efficient." It may be true that the load is fairly constant, but this is true of the total load on the battery of boilers only, and not of the load on each individual boiler. In other words, with, say, six boilers, there may be a total load of 2,400 horse-power, but this does not mean that each boiler is carrying 400 horse-power. Instead, it is more likely that some boilers are delivering considerably above 400 horse-power, while others are carrying considerably below 400 horse-power. Improper feeding of the water will change the steaming output of the individual boilers to a marked extent.

Rapid strides in automatic boiler-feed regulation have been made in recent years. Practically all the large central station plants in the United States that are operated with steam, as well as thousands of smaller plants, are to-day feeding their boilers by means of automatic regulators which give the proper kind of control. The man has been made the supervisor of the apparatus, instead of the mere supervisor of the valve, which is as it should be. A report of the Committee on Power Generation of the American Electric Railway Engineering Association says:

"A great many feed-water regulators are designed to maintain constant water-level and are of a type that closes the supply positively when the water-level is above the desired level and opens wide when it falls below. This method of feed control is responsible for a considerable variation in the steaming capacity of the boiler. Approximately one-fifth of the total heat supplied by the furnace when operating at 200 pounds pressure is represented in raising the temperature of the feed water from 200 degrees F. to steam temperature. The full opening of the valve may deliver water to the boiler at a rate of five or ten times the normal rate of evaporation. Thus, if the feed valve remains open for any considerable time, the total heat input from the furnace may be spent in raising the temperature of the water and at this time the output of the boiler is reduced to practically nothing. These features of feed-water regulation are now better understood, with the result that regulators are now available which give a graduated control of the feed water and permit a variation in the water-level between any two extremes that may be fixed."

When high-pressure boilers first came into use in power-plants, the principal concern of the fireman was merely to keep water in the boiler anywhere from the top



Courtesy Chaplin Fulton Mfg. Co.

REGULATOR FOR MAINTAINING CONSTANT WATER-LEVEL

to the bottom of the drum. Water-level was given very little thought. The only real concern was to prevent burning the boiler shell or tubes and to keep the boiler from blowing up. Injectors were used to force the water into the boiler against the steam pressure. These injectors were usually poor mechanically as well as inefficient, and their operation was one of the most exasperating jobs the boiler tender had. Consequently, the general practice was to start the injector and not stop it until the boiler was entirely filled. Then it would not be started again until the boiler was practically empty. This method is still in vogue in many power-plants, particularly the smaller ones, and should by all means be discontinued.

The first commercial regulator ever made depended for its operation on a float which rode on the surface of the water and rose and fell with it. This type of regulator is still being manufactured and is used today with practically no change in principle, construction, or operation. The art of boiler feeding, however, has advanced so much that the float regulator should not be used excepting under certain conditions,

YOUR CITY IS KNOWN BY ITS HOTEL

What sort of an impression does the hotel in your city make?

More than
\$160,000,000
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has been invested in hotels during the war.

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Do auto tourists linger there?

Do numerous conventions meet there?

Do business visitors have a comfortable stay there?—Or do they hurry on to spend the night elsewhere?

A hotel can draw business to your city, or can repel it.

A small city does not need to wait for "outside capital" to build its new hotel.

Under our plan any progressive city can build a modern hotel without delay.

Information sent on request.

THE HOTEL FINANCING COMPANY
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Until January 1st, 1922, Messrs. Elliott, Moore and Manning Perkins is the firm of Ward, Hill, Pierce and Wells, nationally recognized as the organizers and leaders in the field of money financing by organized enterprise community effort. They extend from this firm to organize the Hotel Financing Company. Their extensive law the joint field give the very best experience and ability in the conduct of Chambers of Commerce and other community organizations planning new hotels.



PENNSYLVANIA

Quality

LAWN MOWERS

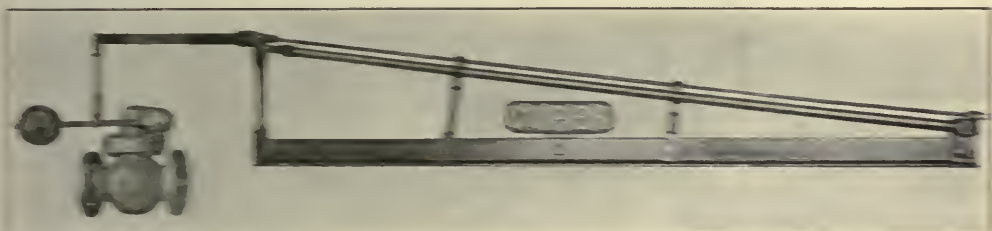
Use them singly, hook them up in gangs, pull them by horse, or push them by tractor, Pennsylvania Quality mowers will prove the speediest, most effective and longest-lived lawn mowers.

Pennsylvania TRIO: a time and labor saver for golf courses, parks, large estates; 36 in. width.

Pennsylvania Quality Lawn Mower parts are not only interchangeable, but are made from the most durable and efficient materials, by highly specialized skill, and are designed to give longest and most satisfactory service.

Write for "Pennsylvania TRIO Book"

Pennsylvania Lawn Mower Works, Inc.
1015 North 23rd Street, Philadelphia



Operating Position, Equipment Co.

BOILER FEED-WATER REGULATOR CONNECTED TO CONTROL VALVE

such is where an absolutely constant level is desired, where the load is actually constant and does not fluctuate, or where oil is used for fuel and can be quickly and directly programmed to the load with automatic apparatus.

There are five desired characteristics for proper feed control:

1. If the load is steady, or even, the water should be fed into the boiler at a steady, even rate in exact proportion with the load. A float type regulator can then be used.

2. When there is a sudden increase in load, this should be accompanied by a relative temporary decrease in feed. A float type should not be used here.

3. When there is a sudden decrease in load, it should be accompanied by a temporary increase in feed, so that the heat from the furnace which previously had been utilized in making steam is now stored up in increased amount of feed water instead of being wasted through the safety-valves or up the stack.

4. When there is a sudden increase in load, the water-level should fall temporarily, so that the stored-up thermal capacity in the boiler itself can help take care of the increase in load.

5. When there is a sudden decrease in load, there should be a temporary rise in level, so that the period of light load can be utilized to store up the heat energy from the coal into the water, and thus be ready for the next sudden heavy demand for steam.

The five desired characteristics for proper boiler-feed control can be universally applied to all types of boilers and under all operating conditions, but they must be applied in a different manner and to a greater or less degree. For example, with a sudden change in load from 100 to 200 horse-power the momentary decrease in water input should obviously not be as great as for a sudden change from 100 to 500 horse-power. The water-level cannot be varied in one type of boiler from light load to peak load as much as in another boiler which may have much greater steam space.


As the equipment in boiler rooms becomes more and more involved, with the addition of water softeners, economizers, feed-water heaters, superheaters, steam and water meters and recorders, and other apparatus to promote economy and efficiency in the generation of steam, it is evident that the rate of flow of feed water has a decided effect upon the efficiency of all this equipment.


A water softener is calculated to handle a certain number of gallons of water per hour on the basis of a continuous even flow. If the flow is intermittent and irregular, a much larger water softener must be installed to handle the same quantity of water, and its operation is far less satisfactory and economical than it would be if the flow of feed water were continuous and more closely in unison with the rate of steam output of the boiler. The same is true of economizers and feed-water heaters. When the flow of feed water through these is retarded, the feed water reaches an excessively high temperature and may even turn into steam, resulting in water-hammer and other troubles in the feed-water system. The apparatus under these conditions allows heat to escape without being absorbed. On the other hand, when at intervals the feed-water valve is opened wide, the feed water rushes through at such a high rate that it is not warmed up to a temperature commensurate with economical boiler operation.

Another saving that accompanies correct mechanical regulation is the use of smaller and less expensive water pumps, control valves and feed lines. In other words, the capacity of a given system can often be increased on installation of additional equipment without spending money for larger units or larger piping. Before the days of modern regulation, regulators were

“Just how will a
FAIRCHILD AERIAL MOSAIC SURVEY
 help our City?”

The City of Newark, N. J., answers—




DEPARTMENT OF STREETS AND PUBLIC IMPROVEMENTS
 BUREAU OF INFORMATION
 CITY HALL
 NEWARK, N. J. March 17, 1922.

THOMAS L. REYNOLDS, CHIEF
 PETER J. OTTOLENGHI, CLERK

Fairchild Aerial Camera Corporation,
 136 West 52nd Street,
 New York City.


Gentlemen

So many inquiries have reached my desk relative to the proposal to make a complete aerial picture of Newark, that it occurred to me you might be interested to know the degree of favorable comment that has been caused by it.

Immediately following the decision of City Commissioner Thomas L. Raymond to have an aerial mosaic photograph of the city taken by the Fairchild Aerial Camera Corporation of New York, a great deal of interest in the proposed picture was shown not only throughout the city government but among school officials and teachers, civic organizations such as the Chamber of Commerce, and the newspapers and private citizens generally. Newark will put its picture to many uses.

The primary object of having the picture is to sell Fort Newark Terminal to the industrial and shipping world. This is an area of 1,075 acres of city-owned, waterfront property. The picture is intended to show this area, as well as many other localities throughout the city suitable for not only industrial purposes but residential development as well.

But there are many other uses to which Newark expects to put this picture. When Commissioner Raymond announced his plan of having this picture made, his entire staff of engineers manifested a keen interest. The Street Department officials


DEPARTMENT OF STREETS AND PUBLIC IMPROVEMENTS
 BUREAU OF INFORMATION
 CITY HALL
 NEWARK, N. J.
 -2-
 March 17, 1922.

THOMAS L. REYNOLDS, CHIEF
 PETER J. OTTOLENGHI, CLERK

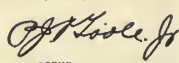
were especially enthusiastic, and informed the Commissioner of a dozen uses to which they could put this picture; likewise, the Water Department, Sewer Department, the Street Lighting Department and the Board of Public Improvements, Commissioner Raymond has charge of all the bureaus noted above, including Fort Newark.

From many other branches of the government I have some expressions of interest in the proposed picture. The traffic division of the Police Department already has applied for a copy of the picture, with the expectation of getting great help in Newark. Precinct commanders, likewise, have indicated a desire for copies. The Municipal Board of Appeals, which is charged with the duty of forcing the building some ordinance in Newark, is most enthusiastic over the prospect of having this complete picture of the entire municipality. Members of the Board have stated that they expect to have occasion to see it not only daily but even hourly. The Tax Board is enthused to the point of importance; taxing officials of many years' experience have informed Commissioner Raymond that their work will be greatly simplified and its efficiency considerably enhanced through the use of the aerial picture.

Fire Department officials have stated that throughout the Newark system, having learned about the picture through the daily press, are daily sending applications to the office of the Board of Education for copies. Thus the picture is expected to become a very important element in the Newark schools. The Chamber of Commerce, the Rotary Club, the Traffic Club, Real Estate Board, and like organizations, are equally anxious to obtain copies of the map after it has been completed. The Real Estate

Board is now undertaking a publicity campaign for the purpose of attracting home-builders to Newark, and will use the aerial picture extensively during this drive.

In view of these circumstances, you can readily understand why I am anxiously looking to the early completion and delivery of the picture.

Very truly yours,

 AGENT.

A Fairchild Mosaic Survey is made by photographing and assembling a series of overlapping vertical aerial views, resulting in a complete map, perfect in detail and mosaic in character.

¶ We will send to any interested City official, gratis, a large gravure reproduction of a Fairchild Aerial Mosaic map, recently made of the City of New York.

FAIRCHILD AERIAL CAMERA CORPORATION
 136 West 52nd Street, New York City

installed merely according to the size of the feed line. Investigation has disclosed, however, that most boiler-feed lines are too large. Not only are the feed lines generally too large, but also the pumps, regulating valves, and all other incidental equipment. This is because with hand or old type mechanical feed the flow of water is intermittent. Extra capacity must be available so that the system, besides supplying the normal demand during its periods of operation, can also make up for what was not supplied during periods of inaction. The control valve should not be chosen in a haphazard manner to conform to the size of the feed lines, as is ordinarily done, because this might result in the same intermittent on-and-off operation characteristic of the old methods and systems.

Insist upon a regulator that is designed for the particular conditions under which the boilers are to operate. The time has passed when regulators are furnished merely to correspond to the size of the feed line. There are now available regulators which are designed for the particular boiler conditions. This involves not only a consideration of the size of the feed line, but also normal rating, maximum rating, steam pressure, water pressure, method of firing, method of pump control, etc., and as a result regulators can be obtained that will give the best possible service under any specific conditions. Ragged and erratic feeding will almost invariably result if the control valve is too large.

In view of the increasing use of higher steam pressures, many consulting engineers are now specifying that on all pressures above 250 pounds, cast steel should be used in place of cast iron on control valves and any other water-containing parts of boiler-feed regulators.

If boiler-feed water contains scale, slime, grit or other foreign impurities, great care must be taken in the selection of a regulator. Be sure that the regulator will not be rendered inoperative by any such ele-

ments. Should grit or slime be present, or should wire-drawing occur, it is well to insist upon interior valve parts made of monel metal. Such parts can be furnished by the regulator manufacturers at a slight additional cost, and in practically every case they will be found to be well worth the slight additional expense.

In the selection of boiler-feed regulators, the following specifications, prepared by the Prime Movers Committee of the National Electric Light Association, will prove helpful:

1. The regulator should conform to the continuous-feed, variable water-level principle.
2. The regulator shall be guaranteed to pass a required amount of water at a certain pressure drop, based on actual test data.
3. The regulating valve shall be of the "high lift" type. It shall lift about $\frac{5}{8}$ -inch from zero feed to maximum required feed.
4. The regulator shall be adjustable, so as to give the full valve travel for any desired limits of the water-level variation.
5. The regulator shall be adjustable for raising or lowering the range of water-level variation in the boiler, at the same time maintaining full valve travel.
6. The regulator shall not have interval friction in excess of 10 per cent of its actuating or moving force. If the internal friction is large, the regulator is liable to "stick" and will feed intermittently.
7. The regulator should be indicating, that is, it should indicate the opening of the valve at all instants and enable the operator to check it up against the water-level.

Other items suggest themselves, such as dependability, attention necessary to keep the regulator operating efficiently, life, cost, etc., but the seven points mentioned above really constitute good regulation and are usually sufficient. The right kind of regulation should not be affected by time of service, climate, or draft. Its response to any given operating condition should be constant over a period of years. On large boilers, two regulators should be installed to adequately take care of the differences in operating conditions and to properly distribute the cold water.

Municipally Owned Power Plants

There are now 2,318 cities in the United States and Canada that own and operate their own electric light and power plants. Of these, 700 have established their municipal plants within the last five years. In 1881 there was but one municipal plant in the United States. Of the cities that now own and operate light and power plants, 275 have a 3-cent rate, 287 have a 5-cent rate, 600 have an 8-cent rate and 615 have a 10-cent rate. These are the retail or maximum rates.



Fence Succeeds Where Signs Fail

KEEPING them off the grass," in Central Park, New York City, has always been a man's size job. In fact, for a time it seemed well nigh impossible to keep the big, unmanageable crowds from trampling down the grass and turning the lawns into an ugly barren. "Keep Off" signs were ignored. But now, thanks to the installation of a Page-Protection Fence around some of the lawns, the problem has been solved.

When it comes to protecting municipal property a Page-Protection Fence is more effective than an officer of the law. Many a dollar has been saved by putting this formi-

dable fence around pumping stations and lighting plants. That's the only way to keep trespassers out and eliminate the temptation to remove tools and materials.

If you are looking for a fence that will really protect, be sure you secure a Page Fence. The many years' experience of the Page Steel and Wire Company, as well as the fact that the company conducts every process of manufacture from the open hearth to the finished product in its own mills, renders the Page-Protection Fence without equal in general excellence today.

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PAGE PROTECTION FENCE

Municipal Finance

BONDING

ACCOUNTING

TAXATION

Municipal Financial Statistics Require Explanation

TO THE EDITOR OF THE AMERICAN CITY:

Your article in the April number under the head of "Finance" prompts me to make some comments, even though I am no longer a city official.

These census bulletins and other statistical tables of this kind are apt to be misleading. In this case they seek to show the excess of receipts over expenditures, or rather the reverse. What nonsense! A taxing body is obliged sooner or later to balance accounts. The year in question ending in 1921 was a peculiarly inopportune year for any such conclusions.

The only way the value of such statistics can be tested is by analyzing a concrete example, so let us see about the city of Cedar Rapids. In the first place, the Census Bureau data include schools, which in this state are entirely separate from city business, and what I have to say, therefore, does not apply to schools, as I know nothing about their finances.

In your case, the tax levy which was disbursed in the year reported upon, viz., ending April 1, 1921, was made by us in August, 1919. Not being good prophets, we thought labor and material costs would certainly decline from war prices, but what happened? Just about as soon as our levy was made, everything began to soar, so that, as a matter of fact, the year in question was about the worst in the whole history of the city government and business, because a city, like any other institution, must pay the fiddler. In this connection I might give our experiences. Our levies for the years 1916-17-18 were 45 mills (on 25 per cent of assessed value); in 1919-20, 44 mills; in 1921, 50 mills; and in 1922, 46 mills. This resulted in the following averages: the levy for three years before the war, 45 mills; for four years during the war, 46.

In our City Treasurer's report for 1920-1,

in the funds on hand at the beginning of the year there was between \$300,000 and \$400,000 proceeds of bonds for which sewer and bridge contracts were outstanding, only a part, or about \$300,000, of which were paid during the year in question. On the other hand, the receipts for the year, because of local changes and changes in bookkeeping, show the receipt of nearly \$200,000 taken into the accounts, but which, as a matter of fact, existed in special funds prior thereto. I know that this matter of "capital" investments or funds is kept separate by the Census Bureau, or, rather, they try to do so, but they may or may not succeed.

In conclusion, I can only repeat the opinion that inferences drawn from such statistics are of little or no value.

Cedar Rapids, Iowa.

J. F. RALL,
Ex-Mayor.

EDITORIAL NOTE.—Ex-Mayor Rall's criticisms of the financial figures issued by the Census Bureau and printed in the April issue of THE AMERICAN CITY reveal one of the dangers of comparative municipal statistics which confront the investigator. There is no doubt that, with each city maintaining its own system of accounting and classification of expenditures, there is wide diversity in the use of terms and in the grouping of figures under the various accepted headings. In some cities, for example, the total tax rate is figured upon all the municipal services, the debt service, and the expenditures of the board of education. In others, money raised for educational purposes and that applied to the state and county taxes is excluded, and the tax rate for the municipality is figured upon the remainder. Until we have a system of uniform municipal accounting for all cities in the United States, these difficulties in the matter of comparisons will doubtless continue.

Great strides, however, have been made in the matter of comparative statistics by the inauguration of uniform systems of municipal accounting in a number of states. Where such uniform systems exist, comparisons between cities of the same size within the state can be made with a fair degree of accuracy.



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Pasadena Lives Within Its Income

TO THE EDITOR OF THE AMERICAN CITY MAGAZINE:

I notice that THE AMERICAN CITY MAGAZINE of April shows the per capita expenses of the city of Pasadena to be \$73.57, while the per capita receipts are \$67.69. We assume you got these figures from the Financial Statistics of Cities of the Department of Commerce, Bureau of Census. It is incorrect in the way it is stated. Our per capita expenses for municipal purposes are \$52.00 and our per capita receipts for municipal purposes are \$53.71. The figures set up by the Bureau of Census include transactions other than those of the municipal government.

In making comparative statistics, it is absolutely essential that the same objects be taken into consideration in each case, and one reason why so much apparent disagreement is found in statistical information is because this fact is not taken into consideration by the magazine editors and newspaper writers. The Bureau of Census, being under the direction of one head at Washington, should be in a position to give accurate comparative information; but unless the findings of the Bureau of Census are properly reported by publicity agents, the records they furnish can be very readily misinterpreted.

Pasadena, Calif.
May 17, 1922.

C. W. KOINER,
City Manager.

Make Civil Service Do What It Was Intended To Do

TO THE EDITOR OF THE AMERICAN CITY:

In response to your request for expressions of opinion on civil service I submit the following statement:

1. The merit system has not been tried and found wanting, as your correspondent suggests; rather, it has not been tried. In the civil service, as in so many other branches of government, we have put our faith in the saving power of legislation and machinery, assuming that any reputable citizen could carry on administration. But, however reputable our civil service commissioners may have been, generally speaking, ignorance of examination and employment technique, i.e., their job, has been the common characteristic. This, combined with limited tenure of office and inadequate funds, is a sufficient explanation of the present status of civil service administration.

2. There is nothing in civil service rules, as your correspondent states, that calls for theoretical examinations, either directly or by implication. Theoretical examinations are the natural recourse of an examining body that exists by sufferance and usually in a state of splendid isolation. So far as examinations are concerned, there is, as a matter of fact, no conceivable type of test which cannot be given under civil service rules, and, what is more, there is no conceivable type of test which has not been given in one civil service jurisdiction or another. The tests given cover the whole range from a personal interview to up-to-date forms of trade and mental tests.

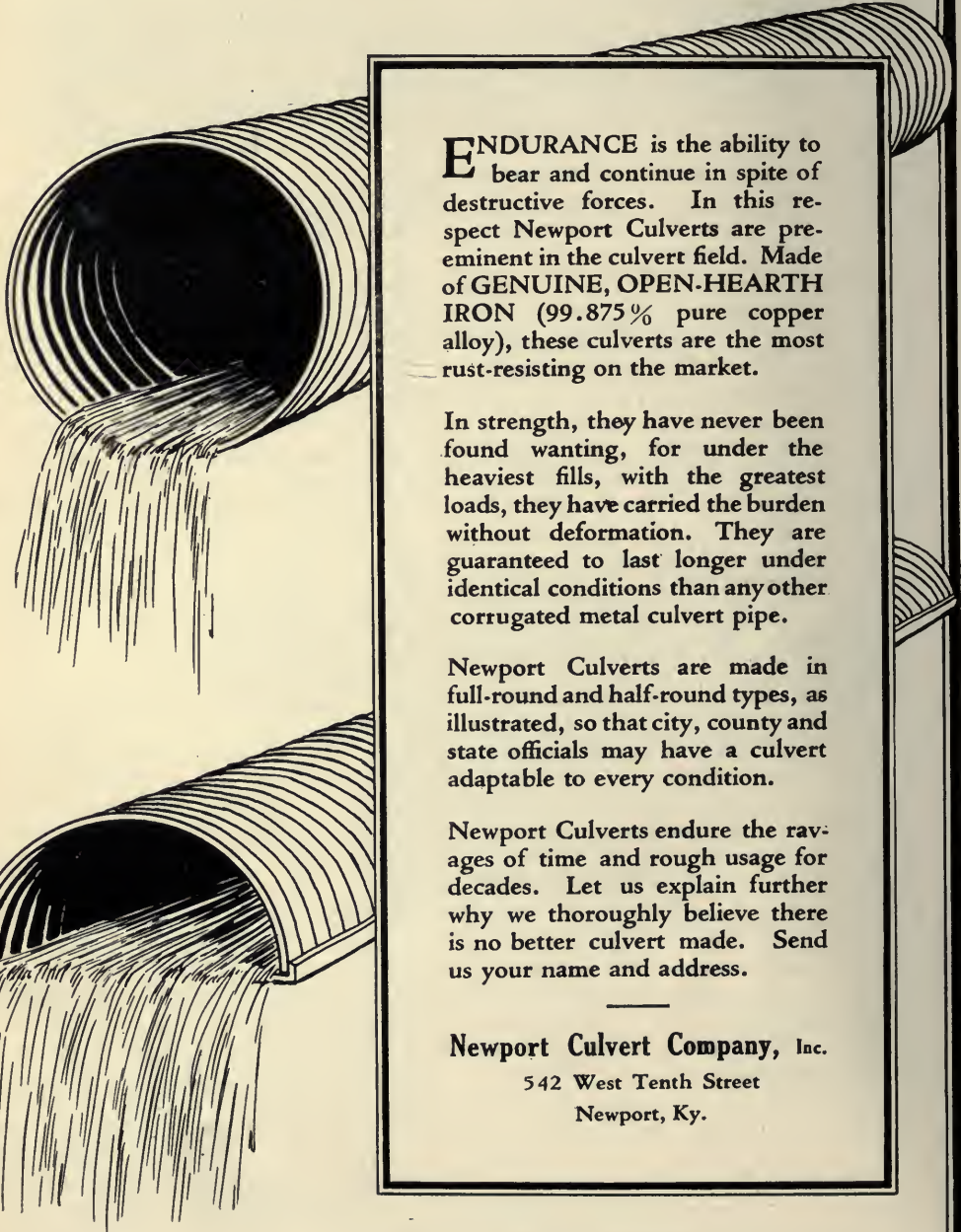
3. The charge that it is impossible to remove inefficient employees from the municipal service is a widespread fiction. There is no basis for it in most civil service laws. The words of the last report of the New York State Civil Service Commission are generally applicable. After stating that the law offers no such protection to the inefficient, the Commission asserts (page 13) that the retention of incompetent employees is "due to lack of administrative force on the part of the head of the office, and the responsibilities and the burdens must be borne by him alone."

The remedy for the existing situation outlined by your correspondent strikes me as being almost academic in character. No political party would dare include the proposed emasculation of the civil service law in its party platform. The man of the street understands civil service and has never failed to register this conviction when a referendum has given him the chance. Civil service control is an established institution and apparently permanent.

The question is, therefore, not whether we shall emasculate or do away with the civil service commission. It is rather by what means we can make it do what it was intended to do. The remedies here suggested are obvious and require little argument: (1) Appoint civil service commissioners who are qualified to administer examination and employment policy; (2) provide appropriations adequate to perform these functions.

W. E. MOSHER,
National Institute of Public Administration.

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Newport, Ky.

New York Zone Plan Growing Stronger

By Edward M. Bassett

Of the New York Bar

THE Greater New York building zone law has now been in operation over five years. The protective requirements are shown on three maps, known as height, area and use. The charter provides that changes in the maps can be made only by the Board of Estimate. The aggregate changes are extremely small in area, showing the remarkable permanence of the protection of the zoning system.

In the years 1916-1921, inclusive, 158 applications for changes were granted by the Board of Estimate, and 134 were denied. These figures tend to show that changes are not easily obtained. This is as it should be, because when an owner builds according to the zoning requirements he ought to be protected against easy changes of surrounding requirements.

Of the total changes there were 4 in 1916, 43 in 1917, 26 in 1918, 20 in 1919, 27 in 1920, and 38 in 1921. It would appear from the figures that during the last three years the map changes were fairly proportioned to the normal growth and change of the city.

Use map changes were 143, area map 11, and height map 4. It is quite possible that as the amount of new construction in-

creases, more changes proportionally will be made in the area and height maps.

In 1916 the 4 changes all relaxed the restrictions; in 1917, 36 relaxed and 7 strengthened the restrictions; in 1918, 20 relaxed and 6 strengthened; in 1919, 13 relaxed and 7 strengthened; in 1920, 12 relaxed and 15 strengthened; in 1921, 15 relaxed and 23 strengthened. In other words, in 1916 there was no strengthening, in 1917 the strengthening as compared to relaxation rose to 19 per cent, in 1918 to 30 per cent, in 1919 to 54 per cent, in 1920 to 125 per cent, and in 1921 to 153 per cent. It will be seen that during the last two years the strengthening changes exceeded the relaxing changes, and that each year the proportion of strengthening changes increased. These figures show not only official support of the zoning plan, but they show clearly that property owners are gradually favoring the strengthening of the zoning requirements rather than their relaxation.

The building zone system of New York may be deemed a success. Other cities which have recently adopted it or are preparing their maps may well be encouraged by the experience of New York.

Building and Loan Income Exempt Up to \$300

By Charles O'Connor Hennessy

President of The Franklin Society for Home Building and Savings, New York

NOT sufficient public attention, perhaps, has been drawn to the provision in the current Federal Revenue Act which took effect at the beginning of this year, and which, by paragraph 10 of subdivision (b) of section 213 exempts from income taxes

"so much of the amount received by an individual after December 31, 1921, and before January 1, 1927, as dividends or interest from the domestic building and loan associations operated exclusively for the purpose of making loans to members, as does not exceed \$300."

The Internal Revenue Commissioner construes this to mean that income received during the five years 1921 to 1926 inclusive

by a member of a building and loan association is exempt to the extent of \$300 per year.

This provision is a result of the agitation carried on for some years by the United States League of Local Building and Loan Associations representing more than 8,000 associations in the country, and is designed to increase the funds available in these institutions for the making of loans to individual homeseekers. Such loans last year, according to United States League figures, amounted to \$700,000,000, although in most sections of the country the demand for small mortgage accommodations is far in excess of the supply of money.

The Truth About Drinking Fountains



UNSAFE

No. 1. Vertical stream which permits saliva and waste water from the drinker's mouth to fall back to source of supply. No longer considered sanitary.

UNSAFE

No. 2. Modification of vertical stream. This slight angle is little if any improvement over No. 1.

IMPRACTICAL

No. 3. More sanitary if properly used. However, stream is hose-like with no definite drinking point. Difficult to drink from.

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An Ideal Fourth of July

By Mrs. Percy V. Pennybacker

Chairman, Department of Citizenship, General Federation of Women's Clubs

THE General Federation of Women's Clubs has undertaken to make a direct contribution to American life by transforming July Fourth into a day of consecration to the old ideals of honor, patriotism and courage that have lived always in the pages of our history—a great Citizenship Day, for all classes of Americans, those born on American soil as well as those who have come from foreign lands. Here is the plan:

Reawaken the dormant patriotism of the native-born; stimulate the newcomers to pride and interest in the country of their adoption by a reverent observance of the day.

Rally the forces of the entire community to participate in an outdoor meeting at which all young men and women coming of age this year and all foreign-born citizens naturalized within the last year shall be the guests of honor.

Let a great processional be one of the outstanding features, the new citizens leading, with civic and patriotic organizations following in distinct groups, veterans of past wars—especially of the World War—being given the places of honor after

the new citizens. Have no music that is trivial, unfamiliar or unrelated to national ideals. Secure as many bands as possible, using foreign bands also.

Use the flags of America and of your state in conspicuous places.

Arrange for a central reception place where these new citizens will be formally greeted and welcomed and where a brief inspirational program can be given.

Select speakers of the highest standing and ability, who are known to realize the value of brevity. When the orator finishes, the Chief Magistrate of the town or county

or state reads aloud the names of the new citizens and administers to them the solemn civic oath. He then charges the community to see to it that they do everything in their power both by example and by precept to help the voter realize the honor and dignity and responsibility of the privilege that is now his. If we really place such an honor upon the entrance into civic life, it will be no idle dream to think that the day will come when each young person on the eve of casting his first vote will feel as d'd the squire of old on the eve of knighthood.

Programs and other literature concern-



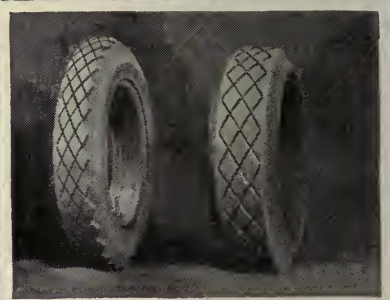
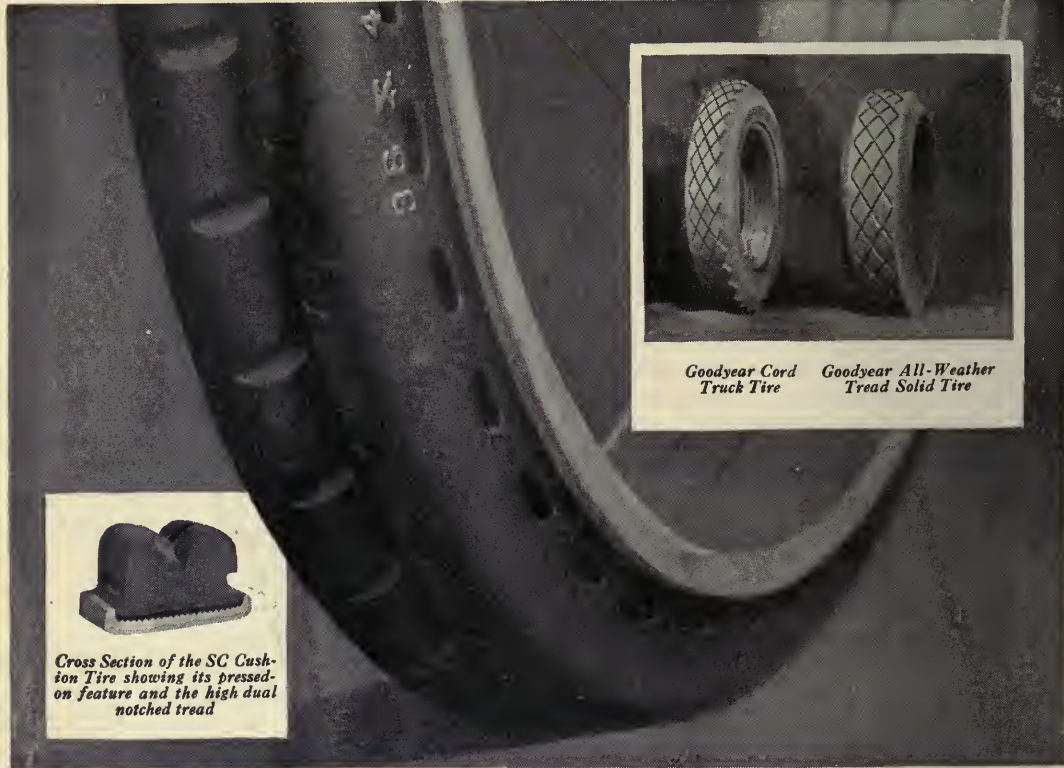
WELCOMING NEW CITIZENS, ATLANTA, GA., JULY 4, 1921

ing this matter may be had by writing the General Federation Headquarters, Maryland Building, Washington, D. C. Last summer some three hundred towns adopted this plan. This year we fully expect three thousand to observe July Fourth in fitting manner. The President of the United States has given his hearty approval to the plan, and both the American Legion and the Auxiliary have offered to help.

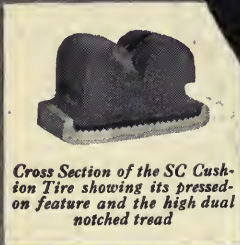
Will you not join forces with the General Federation and assist in making July Fourth the most solemn, the most uplifting and beautiful day in our civic calendar.

THE AMERICAN CITY

GOODYEAR



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Cross Section of the SC Cushion Tire showing its pressed-on feature and the high dual notched tread

Goodyear (SC) Cushion Fire Truck Tire

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Monterey Chemical Hose

The City's Legal Rights and Duties

Information for City Attorneys and Other Municipal Officers, Summarizing
Important Court Decisions and Legislation

Conducted by A. L. H. Street, Attorney at Law

Ordinance Imposing License Taxes Against Sellers of Used Automobiles Held Not Unjustly Discriminatory

"Every person, firm or corporation engaged in the business of selling, exchanging or buying second-hand or used automobiles or other motor vehicles for the purpose of resale or exchange of same shall pay a license [fee?] of \$50 per quarter for each such place maintained, provided, however, that persons reselling used automobiles or other motor vehicles taken in exchange or part payment for new automobiles or other motor vehicles shall pay a license [fee?] of \$25 per quarter."

This section of an ordinance of the city and county of San Francisco is upheld by the California District Court of Appeal as being a valid measure, in the case of Higgins, 195 Pacific Reporter, 740. Justifying the distinction drawn between the two classes of dealers in used cars, the Court says, in part:

"It is a matter of common notoriety that the theft, disguise, and resale of motor cars has become so common as to tax the powers of the police throughout the United States to recover the stolen cars and to bring the criminals to trial. It would be fatuous to assume that a motor-car thief would very often pay the difference between the second-hand value of a used car and the selling price of a new car. The tendency of the thief would be to get money in exchange for the stolen car from those in the business of buying used cars for resale."

The Kansas Supreme Court Denies Validity to Ordinances Which Arbitrarily Obstruct Enjoyment of Private Property

In the case of Smith v. Hosford, 187 Pacific Reporter, 685, the Kansas Supreme Court not only annuls an ordinance purporting to give municipal commissioners arbitrary power to deny permission to conduct garages and automobile repair shops, but questions the validity of any ordinance which interferes with the enjoyment of pri-

vate property arbitrarily, capriciously, or oppressively.

The ordinance under fire was one adopted by the city of Kansas City, Kan., forbidding issuance of licenses for "carrying on the business of a garage or automobile repair shop, unless the application for such license be approved by the board of commissioners."

The measure was successfully attacked as failing to provide any general rules under which licenses might be issued or denied, and as permitting arbitrary denial of licenses.

The city attempted to support the ordinance as valid exercise of the police power to promote the health, comfort and safety of citizens; admitting that a garage or repair shop is not an inherent nuisance, but contending that its location may be municipally controlled to prevent its being so conducted as to be offensive.

The Court does not contradict the city's claim that before the courts can interfere with the exercise of legislative power granted to the city some abuse of such power must appear. But it is said:

"The test laid down in *City of Emporia v. Railway Co.*, 94 Kan. 718, 719, 147 Pac. 1095, 1096, is this:

"The question is whether or not, considering the entire situation and all the circumstances, the action of the city so far fails to measure up to the fair and just and reasonable as to make it clear that such action is arbitrary, capricious, unreasonable, and oppressive. * * *

"Of course, a garage is not a nuisance in itself, but is becoming more and more necessary and profitable, and is a legitimate and lucrative means of making a living and adding to one's capital. While, no doubt, a city may regulate and look after the operation of this, as well as other things, which, by an unlawful use may become injurious, it cannot, without tyranny, refuse a citizen to use his property in this way when properly managed. And, by the same token, it must be held that a city cannot authorize one or more of its officers to prohibit such use."

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Equal Benefit to All Abutting Property Owners Is Not Essential to the Validity of a Local Assessment

Sustaining the validity of a street sprinkling assessment in the case of *City of Lafayette vs. Tanner*, 89 Southern Reporter, 314, the Louisiana Supreme Court lately observed:

"It is not essential to the validity of a local assessment, or forced contribution, imposed for street improvement, that all persons upon whom the assessment is levied shall be equally benefited. It is sufficient that the theory of special benefit to the locality in which such an assessment is levied shall be founded upon reason, and that the apportionment of the assessment shall have a reasonable foundation of fairness and equality, and be not arbitrary or discriminating."

Keeping Minutes of Municipal Meetings—Validity of Ordinance Suppressing Pool-Rooms

Among other matters, the Illinois Supreme Court passes upon the sufficiency of a municipal clerk's minutes of meetings and upon the power of the Legislature to authorize suppression of public billiard- and pool-rooms, in the case of *Village of Atwood vs. Otter*, 129 Northeastern Reporter, 573. On these points the Court says:

"This Court has held that the clerk of a municipal authority is not required by the statute to prepare by his own hand or write out the findings or orders of the municipal authorities in the record; that the essential thing is that a record be kept by the clerk which shall show accurately the record of the meeting, that is, it is only necessary to show that the record is his record and that the proofs show that it is in accordance with the truth. *Hepler vs. People*, supra; *People vs. Carr*, 231 Ill. 502, 83 N. E. 269.

"The rule, as we understand it, is, that a statute or ordinance which tends in some degree towards the prevention of offenses or the preservation of the public health, morals, safety, or welfare is within the police power of the state. There can be no question that pool-rooms or the keeping and using of pool- and billiard-tables in places of public resort may tend in some degree towards a disturbance of the public welfare. It is well known that such rooms may become congregating-places for idlers and loafers. As was said by the Supreme Court of Nebraska in *Morgan vs. State*, 64 Neb. 369, 90 N. W. 108, a pool-hall in a village is apt to degenerate into a trysting-place for idlers and a nest for vice. Conceding, for the purposes of the argument, that a pool-room is not necessarily in itself a nuisance, the argument of counsel for appellants practically admits that it might become so because of its surroundings. If a thing neither necessary nor

useful may or may not be a nuisance in itself, depending upon local conditions and facts and circumstances surrounding its use, the determination whether it is a nuisance or not rests with the Legislature or the municipal authorities, and their finding is binding upon the courts."

City May Adopt Daylight Saving When Applied Only to Municipal Matters

The Ohio Supreme Court recognizes the right of a city to adopt daylight saving where no attempt to interfere in non-municipal matters is involved.

An ordinance of the city of Cincinnati provided that there should be submitted to the electors of the city on April 27, 1920, the question of establishing in the city from 2 o'clock A. M. of the last Sunday in April to 2 o'clock A. M. of the last Sunday in September a standard of time which should be that of the seventy-fifth meridian of longitude west from Greenwich. This ordinance further provided that, if a majority of voters at the election voted in favor of the ordinance, all municipal offices and legal proceedings should be regulated by the time at the seventy-fifth meridian west of Greenwich. The election resulted in a favorable vote for the ordinance.

It was contended that that ordinance was invalid for the reason that it was contrary to the statutes and constitution of Ohio.

The Supreme Court, in denying this contention, says (*State ex rel. Cist vs. City of Cincinnati et al.*, 129 Northeastern Reporter, 595):

"It is to be observed that by the provisions of the ordinance enacted it is attempted only to require that the purely municipal affairs of the city shall be regulated by the standard of time thus adopted. The mere statement of the purpose and effect of the ordinance shows that it has to do only with the details of local government, and purports only to prescribe a standard of time which shall apply to required acts of any board or officer of the municipality.

"This is clearly authorized by the provisions of section 3, art. 18, of the constitution (the Home-Rule Amendment). The ordinance has and can have application only to matters coming within the express power thereby delegated to, and conferred upon, the municipality. It prescribes the standard of time in accordance with which its own local offices and purely municipal transactions shall be operated and regulated. It must be conceded that the standard of time prescribed by the law of the state governs and controls as to all matters except those having to do solely with local governmental action and procedure."



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CRIMINAL JUSTICE IN CLEVELAND

Reports of the Cleveland Foundation survey of the administration of criminal justice in Cleveland, Ohio. Directed and edited by Roscoe Pound and Felix Frankfurter. The Cleveland Foundation, Cleveland, Ohio, 1922. XXVII + 729 pp. Illustrated. \$3.75.

This survey, undertaken at the suggestion of the Cleveland Bar Association, was conducted by a number of nationally known specialists. The substance of the report includes: "Police Administration," by Raymond Fosdick, author of "American Police Systems"; "Prosecution," by Alfred Bettman, formerly City Solicitor of Cincinnati; "The Criminal Courts," by Reginald Heber Smith and Herbert B. Ehrmann, both of the Boston Bar; "Correctional and Penal Treatment," by Burdette G. Lewis, State Commissioner of Institutions and Agencies in New Jersey; "Medical Science and Criminal Justice," by Dr. Herman M. Adler, State Criminologist of Illinois; "Legal Education in Cleveland," by Albert M. Kales, of the Chicago Bar, author of "Unpopular Government in the United States"; "Criminal Justice in the American City," by Roscoe Pound. The summary was written by Dean Pound of the Harvard Law School. Among the principal recommendations may be cited: a single civilian police commissioner, in full charge of promotion and discipline of the police force; greater use of motor equipment and control; better organization of the work of the prosecutors; consolidation of municipal and county criminal courts; a plan whereby a judge who is a candidate for reelection may run without opposition; and the abolition of the coroner's office. The surveyors found that the chief difficulties concerning Cleveland arise from the fact that the police and criminal systems were designed to fit small, pioneer towns. Public officials who have to do with the administration of criminal justice will find much that will help them in the thorough analysis and summaries of modern practice contained in these reports.

AMERICAN CEMETERY LAW

A. L. H. Street, of the Minnesota Bar. Park and Cemetery, Madison, Wis. 1922. 532 pp. \$6.00.

A digest of the cemetery laws of all the states and of the important court decisions. This volume is divided into two parts, the first a general reference section covering the legal status of cemeteries, liabilities in the handling of bodies, cemetery funds, assessments, the law on permits, perpetual upkeep, tax exemption, and the law covering cemetery land. The second part deals with the various state statutes and the decisions arising under them. A valuable reference book for anyone connected with cemetery management.

ECONOMICS AND THE COMMUNITY

John A. Lapp. The Century Company, New York. 1922. XIV + 366 pp. Illustrated. \$1.75.

A text-book intended to meet the needs of first-year classes in high school, vocational school classes, and continuation classes. The plan of instruction outlined provides for preliminary gathering of local data for each chapter, before beginning the study of the text. Questions and problems follow each chapter. Among the subjects covered are consumption, production and distribution of goods, business organization, transportation, finance, labor problems, taxation, conservation and social control. Well-chosen illustrations add to the value of this compact and timely book.

CITY PLAN FOR EAST ORANGE, N. J.

A quarto pamphlet of 80 pages prepared by the City Plan Commission of East Orange. The Technical Advisory Corporation, consulting engineers, New York, assisted in the preparation of the comprehensive plan, the final report on which was recorded by the Commission last November. This publication is an abridged reproduction of the report and covers all the various phases of such a thorough study. It is adequately illustrated with maps and drawings. A number of methods new in city planning were applied by the city engineers to the collection, analysis and presentation of data and to the actual solutions of the problems involved. (Apply to Charles A. Heiss, Secretary of the Commission.)

THE RURAL COMMUNITY

Llewellyn MacGarr, M. A. The Macmillan Company, New York. 1922. XV + 239 pp. Illustrated. \$1.80.

Chamber of commerce secretaries, farm bureau managers, executives, teachers, preachers and leaders in country life improvement, will find in this compact volume a stimulating guide. It discusses briefly the strategic importance of agricultural life, contrasts between rural and urban districts, the survey and its adaptation to rural communities, their chief characteristics, the problem of the socially defective, district schools, the rural secondary school, the constructive economic and social forces in farm life. Study questions and numerous illustrations and copious references at the end of each chapter add greatly to the value of the book.

CIVIC SCIENCE IN THE COMMUNITY CIVIC SCIENCE IN THE HOME

George W. Hunter, Ph.D., and Walter G. Whitman. A. M. American Book Company, New York. 1922. 430 and 416 pp. Illustrated. Each \$1.40.

These two text-books are frankly designed to take into account the view-point of the child. The illustrations are chosen to interest him. The first discusses the ideal community, the effect of climate upon it, the relation of water to power, food production, forests and community health, the organization of a city government, how the city obtains its food, how diseases are spread and how to fight them, waste disposal, street lighting, safeguarding of life and property, good roads, transportation, and aeronautics. The other volume, "Civic Science in the Home," covers a similar series of subjects dealing with the home as a small community.

THE EMPIRE MUNICIPAL DIRECTORY AND YEAR BOOK, 1922-1923

Sanitary Publishing Company, Ltd., 8 Breams Building, London, E. C. 4. 305 pp. and Diary pp. for the years 1922 and 1923. Price 10s. 6d.

This volume claims to be the most comprehensive municipal directory published, containing a complete list of all the corporations, county, urban and rural district councils in the British Empire, with the names of all officials. The directory contains up-to-date articles written by specialists on road construction and maintenance, building construction, street lighting, motor vehicles, water-supply, sewerage and sewage disposal, sanitation and waste utilization. It also contains a list of the municipal engineering, public health and scientific societies, and a bibliography of municipal and public health literature.

THE SCIENCE OF PURCHASING

Helen Hysell. Introduction by J. George Frederick. D. Appleton & Company, New York. 1922. XI + 261 pp. Illustrated. \$2.50.

A handbook on the science of purchasing according to the most up-to-date practice. The book opens with a discussion of the personal qualities necessary for successful purchase management. Then follows a discussion of plans and resources, source of supply, principles and quality, and the attitude which should be taken toward salesmen. Cooperation and coordination between executives, standardization, analysis of market conditions, and the legal side of contracts, are each covered in complete chapters. The ethical side of purchasing, the organization of the purchasing department, and its method of operation are fully discussed, and records and forms are included. Altogether, it should prove of practical value to purchasing agents and those who wish to study the profession.

WATER-SUPPLIES IN MASSACHUSETTS

"Report of the Joint Board consisting of the State Department of Public Health and the Metropolitan District Commission Relative to Water Supply Needs and Resources of the Commonwealth." January, 1922. House Publication No. 1550 of the Commonwealth of Massachusetts. 284 pp. Maps, plans, diagrams. (Apply to X. H. Goodnough, chief engineer, State Department of Health, Room 141, State House, Boston, Mass.)



Cletrac's Utility Is Almost Unlimited

CITIES owning Cletracs find that these compact, powerful crawler-type tractors are able to handle an almost unlimited variety of jobs. In the parks, on the boulevards, grading, rolling, mowing, pulling street sprinklers, pushing snow plows, summer and winter, Cletrac does all the work of several horses and much that horses could never do. Remember, Cletrac's operating and upkeep expense is so low and its range of usefulness so great—that Cletrac will show a saving over other power or horses every time.

When the work around town is done, Cletrac helps pay for itself by taking over all kinds of road-building and maintaining jobs in the surrounding country.

If you are interested in cutting down your city expenditures—write us. We will gladly supply you with a list of towns and cities already using Cletracs as regular equipment. From them you can learn all about the saving which Cletrac performance has brought.



HARD THIS WAY, BUT—



EASY ON A TRACK THE CLETRAC WAY

THE CLEVELAND TRACTOR CO.

Largest Producers of Crawler Tractors in the World

19205 Euclid Ave.

Cleveland, Ohio

ZONING PATERSON, N. J.

"Zoning: The First Step in Planning Paterson." Final report of the Commission on Building Districts and Restrictions, Paterson, N. J. By Herbert S. Swan, consultant. Plan adopted November 29, 1921. 54 pp. Maps and diagrams. Large building zone map enclosed in envelope. Explaining the plan under the following chapter heads: Necessity for Planning; Building Lines; Location of Accessory Buildings in Residence Zones; Families per Acre; Non-Conforming Uses; Board of Zoning Appeals; Amendments. Giving in full the building zone ordinance. (Apply to John J. O'Rourke, secretary, Commission on Building Districts and Restrictions.)

THE HEALTH OF PORTLAND, ORE.

"Public Health Methods and Their Application in Portland." A preliminary study by the Public Health Bureau of the City Club of Portland. February, 1922. 40 pp. Approved by the Board of Governors, but not officially adopted by the club before being published. Presenting facts on the organization, administration and activities of the Bureau of Health, and on Portland's water-supply, sewage and garbage disposal, housing, port inspection, industrial hygienic, maternal and infant welfare, school inspection, treatment of tuberculosis and venereal diseases, and out-patient clinics. Recommendations for further health research work by the City Club are included. (Apply to Dr. N. E. Wayson, Chairman of the Bureau.)

RECREATION TRAINING

Announcements for 1922-23 of the Recreation Training School of Chicago, the successor of the Recreation Department of the Chicago School of Civics and Philanthropy, 800 South Halsted Street, Chicago. (Hull House.) 32 pp. (Apply to the school.)

MUNICIPAL RESEARCH IN TORONTO

Eighth Annual Report of the Toronto Bureau of Municipal Research for the year ending February 28, 1922. The Bureau is financed through direct appeal to public-spirited citizens. (Apply to John Macdonald, President of the Bureau, 189 Church Street, Toronto, Ont.)

FUN FOR EVERY ONE

"A Pocket Encyclopedia of Good Times." Suggestive social and recreational programs for community groups. Published by Community Service, 315 Fourth Avenue, New York, N. Y. April, 1922. Price 50 cents. Convenient handbook size, 112 pp. Fun for family and neighborhood parties, for separate groups of boys and girls, men, women, and young men and women, in rural districts, towns and cities, readily adapted for use in schools, church parlors, town halls and all kinds of community gatherings. (Apply to publishers.)

GOOD ROADS

Official Proceedings of the Twelfth American Good Roads Congress, Nineteenth Convention and Annual Business Meeting of the American Road Builders' Association, held at Chicago January 17-20, 1922, and at New York November 15, 1921, respectively. Officers reports and list of exhibitors at the Thirteenth National Good Roads Show. Edited by Clifford Spurrier Lee. XXIV + 273 pp. Illustrated. Price, \$3. (Apply to the Association, 11 Waverly Place, New York, N. Y.)

KANSAS TAX RATES

"City Tax Rate Bulletin for 1921." A compilation of the city, school and county tax rates effective for 511 cities in Kansas, together with their population, assessed valuation and bonded indebtedness. Bulletin No. 31, compiled by the Municipal Reference Bureau, University Extension Division, University of Kansas, Lawrence, Kans. April 1, 1922. Price 25 cents. Published by League of Kansas Municipalities, Lawrence, Kans. Reprinted from Kansas Municipalities, April, 1922. 28 pp. (Apply to John G. Stutz, secretary of the League.)

MINNESOTA CITY CHARTERS

"City Charter Making in Minnesota." by William Anderson, Ph.D., Associate Professor of Political Science and director of the Bureau of Research in Government of the University of Minnesota. Bureau Publication No. 1, 1922. 198 pp. Diagrams. Explaining with careful detail how city government has developed in Minnesota, analyzing its present forms, and showing how far the power of the State Legislature goes in municipal affairs. The principles and problems of charter making are dealt with, and a separate chapter on the making and amending of home rule charters is given. A model charter designed primarily for cities having less than 20,000 is given. There is also a bibliography of the subject, and the book is fully indexed. Price \$1.00. (Apply to the University of Minnesota, Minneapolis, Minn.)

TREES FOR TOWN AND CITY STREETS

This bulletin describes the principal trees that are used for street planting in the United States. A contribution from the Bureau of Plant Industry, Washington, D. C. Issued March, 1922, as Farmers' Bulletin 1208 of the United States Department of Agriculture. A very valuable pamphlet of 44 pages describing and illustrating with many views the kinds of trees suited to different types of streets and to different regions. Attractive, interesting and authoritative, and an important aid to city foresters and park superintendents. (Apply to the Government Printing Office, Washington, D. C.)

CITY NOISE

"Health Problems Involved in Noise and Fatigue," by Prof. Henry J. Spooner, M. I. Mech. E., member of the International Committee on Industrial Fatigue, London, England. Reprinted from The Nation's Health, February and March, 1922. Quarto. 30 pp. "The correction of badly balanced machinery and the obviating in civil and industrial life the maddening, meaningless fanfare of sounds that sap our nervous reserves becomes an urgent engineering problem, international in scope." (Apply to The Modern Hospital Publishing Co., Chicago, Ill.)

NEW JERSEY WATER-SUPPLIES

"Report on Water Resources of the State and Their Development," made by Hazen, Whipple & Fuller, Civil Engineers, to the Board of Conservation and Development, Trenton, N. J. 76 pp. Maps and tables. Closing with a suggested plan of procedure for providing water enough to supply a district in which there are now thirty-three separate systems of water-supply—a plan involving the creating of public interest and the securing of cooperation to carry out this great project. (Apply to the Board.)

HOTELS

American Travel and Hotel Directory, published annually by American Travel and Hotel Directory Co., Inc., Baltimore, Md. XXXII + 2,010 pp. Many illustrations. Map of South America, showing principal cities and railways. Not only listing hotels, with the usual details, but reporting historical and geographical details of the various sections of North and South America. Leading restaurants and commissary supply houses are also listed. Price \$10. (Apply to publishers.)

THE LINCOLN HIGHWAY

"A Brief Account of the Eighth Year of Progress on the Lincoln Highway—1921." Published January, 1922. 24 12x9 pp. Illustrated. (Apply to the National Headquarters, The Lincoln Highway Association, Detroit, Mich.)

MULTNOMAH COUNTY, OREGON

"Budget Facts and Financial Statistics of Multnomah County (Portland), Oregon, for 1922." 1921 Annual Report of the Tax Supervising and Conservation Commission of Multnomah County. 92 pp. Many tables and diagrams. (Apply to C. C. Ludwig, executive secretary, 101 Court House, Portland, Ore.)

PENSIONS IN PUBLIC EMPLOYMENT

A report, under this title, of the Pension Committee of the National Municipal League. Prepared by Paul Studensky, director of the Bureau of State Research of the New Jersey State Chamber of Commerce. From the National Municipal Review, April, 1922. 30 pp. Covering the following divisions of the subject: Main Defects of Existing Systems; Preliminaries of a Sound System; Financial Structures; Benefits; Establishment, Administration and Membership; Treatment of Unsound Systems; Sound Systems in Operation; Sound Pension Bills About to Become Law. Including four actuarial tables and a brief bibliography. (Apply to the National Municipal League, 261 Broadway, New York, N. Y.)

WHERE TO FIND OUT ABOUT ZONING

A "Selected Bibliography of Zoning," 16 mimeographed pages, containing critical references to the most important articles on the subject, from periodicals and books. Special sections are devoted to the arguments for and against zoning, to the legal aspects of zoning, and to such technical matters as the relation of city planning to zoning, the different types of districts, and agencies and administration for zoning. (Apply to Division of Building and Housing, Department of Commerce, Washington, D. C.)

TAXATION IN CLEVELAND

"A Letter to East Cleveland Citizens from City Manager C. M. Osborn, Setting Forth the Amount and Distribution of Your East Cleveland Taxes for 1922, and a Special Bulletin announcing a \$78,000.00 Cash Balance at the close of the year 1921." 4 pp. With "Tax Dollar Diagram." (Apply to the City Manager.)

TRINIDAD in Boston



Arlington Street, Boston, paved with Trinidad Lake Asphalt in 1901, and still in splendid condition.

Quality streets demand a quality paving

And that's why Arlington Street, Boston—as most of the world's finest thoroughfares—is surfaced with Trinidad Lake Asphalt Paving.

Attractive—resilient—noiseless—TRINIDAD streets are also long-lasting and remarkably low in maintenance cost. Thirty or more years' service—at less than a cent per square yard per year for maintenance—is common record.

Trinidad Lake Asphalt is a native bitumen—storm-beaten and sun-cured in the tropics for Ages. It resists heat, cold, water and wear to a greater degree than any other bituminous product known.

More than four million tons of this remarkable material have been used in street and road building since 1879—enough to surface a roadway, eighteen feet wide, extending around the entire world!

Trinidad Lake Asphalt is also the foundation for numerous products included in the famous Genasco Line. Write for illustrated folders.



The Genasco Line includes asphaltic roofing, flooring, paints and allied protective products. Write for descriptive matter.

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Methods, Materials and Appliances

News for City and County Engineers, City Managers, Water-Works Superintendents, City Controllers, Park Superintendents, Purchasing Agents, and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

A Stone Unloader for Trucks and Cars

Most contractors have experienced the difficulties of unloading stone by hand from railroad cars onto trucks or wagons for delivery to the job. The Burch Plow Works Company, 104 Bucyrus Street, Crestline, Ohio, manufactures a stone unloader which handles any size of stone used for road construction and saves the labor of from three to ten men. It is simple in construction, easy to install and operate, and greatly speeds up the work. Through the feed doors of the platform onto which the stone is dumped, the stone falls upon a continuous belt, which conveys it to the wagon or truck bed. This belt is of the regular conveyor type, 16 inches wide, 4-ply, $\frac{1}{8}$ -inch rubber-top covered, and made especially to insure maximum toughness, strength and durability. The conveyor belt, running at a speed of 225 feet per minute, delivers stone to the wagon at a rate of 1 cubic yard every 60 seconds. The feed platform upon which the stone falls from the car is fitted with three movable feed doors that are opened or closed by means of three easily accessible levers. Thus the feed is controlled and regulated, and because of the convenient manner of locating the machine and the accessibility of the feed levers, one man can easily handle this part of the work.

The machine is so constructed that the elevator can be set at an angle of 26 degrees.

Thus, when the wagon stands on level ground, the upper end of the elevator is $7\frac{1}{2}$ feet from the ground, and the wagon or truck is only 20 feet from the track. The machine is guaranteed to carry stone at an elevation of as much as 29 degrees, making it possible to raise the delivery end of the elevator higher than $7\frac{1}{2}$ feet if necessary. A clutch provided at the delivery end of the elevator and within reach from the wagon enables one man to handle that end of the job.

Special Paints for Marking Traffic Lines

Many of the cities that maintain safety zones at street crossings or where street cars stop, indicate them by white strips painted on the pavement. To keep these strips in such condition that they are readily recognized by vehicular traffic, a paint of heavy base and good wearing qualities must be used. The Hoosier Paint Works, Fort Wayne, Ind., claims to make a long-wearing paint. In a number of instances, lines made with this paint have lasted from three to seven months, depending on the amount of heavy traffic which passes over them. The paint can be applied with a brush or a marking machine, and dries quickly.

Technical Publicity Company

The Technical Publicity Company, Bissell & Land, Inc., Pittsburgh, Pa., has removed its office to Suite 609-611, 337-339 Second Avenue, Pittsburgh, Pa.



LOADING GRAVEL FROM FREIGHT-CAR TO TRUCK



BEST
TRADE MARK
TRACKLAYER
REGISTERED
TRACTORS

Tractors for power, speed, economy

Preparing streets for repaving, breaking up old pavements, making new thoroughfares, all require an abundance of steady, dependable power.

Scarifiers, plows, drills, levelers, scrapers, graders, etc., do their best work, and more of it, when propelled by good tractors. This is because the tractor has the reserve power to keep the tool moving constantly at proper speeds and with proper adjustments for maximum results.

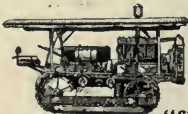
Tractors like the BEST concentrate the pulling power of a large number of animals within a small unit which is easy to manage, easy to maneuver, and which has none of the weaknesses of the flesh.

Best Tractors are famous for stamina, power and dependability, and their cost for up-keep and operation is small. That is why they are being adopted more and more by municipal, county and state officials for road and street making and maintenance.

Let us send you further details on the use of tractors for road and street work. Write for catalogs, prices and names of our nearest dealers.

C. L. BEST TRACTOR CO.
SAN LEANDRO - CALIFORNIA

There are three models of Best Tractors—the "Sixty," the "Thirty" and the "Cruiser" (60). All are factory-built—not assembled.



"Sixty"



"Thirty"



"Cruiser"



REDUCES THE NOISE FROM TELEPHONING

Make Telephone Conversation Private

One of the annoyances of using a telephone in an office is that any conversation is practically public. The Hush-A-Phone Corporation, 41 Union Square, New York City, has brought out a device for attaching to the transmitter of the telephone which promotes privacy, excludes outside noises from the wire, thereby improving transmission, and prevents telephoning from distracting office associates and workers, with resultant efficiency. It is claimed that this device is equal to, and in many respects superior to, a booth. Its convenience on the desk appeals to busy officials, and its use is increasing in those instances where telephone efficiency is recognized as of prime importance in transmitting business.

Cletrac Makers Expand

The Cleveland Tractor Company, Cleveland, Ohio, manufacturer of the Cletrac, a medium-weight tractor, is to be reorganized as the Allyn-Zeder Motors Company, to manufacture and market the new six-cylinder car which is being designed by F. M. Zeder, formerly chief engineer of the Willys Corporation and the Studebaker Corporation. The reorganization will be brought about by adding approximately \$5,000,000 of new capital to the present assets of the Cleveland Tractor Company, resulting in a corporation with a capital of \$10,000,000 of preferred stock and 200,000 shares of no par common stock.

A new corporation, subsidiary to the Allyn-Zeder Motors Company, will be organized under the name of The Cleveland Tractor Company and will continue the marketing of Cletracs through its present distributors and dealers. A new 1-ton truck, embodying ad-

vanced details in designs, engineered by Rollin H. White, will be added to the Cletrac line in the near future. The reorganization plan is practically ready to submit to the stockholders of the Cleveland Tractor Company, and the cooperation of several of the larger stockholders practically assures its adoption.

E. E. Allyn, second largest stockholder in the tractor company, whose name is included in that of the new company, is a director of the Aluminum Manufacturers, Inc.; Rollin H. White, President of the Cleveland Tractor Company and a director of the Aluminum Manufacturers, Inc., will be President of the new corporation. Other officers will be: R. T. Hodgkins, General Sales Manager of the Cleveland Tractor Company, Vice-President; A. F. Knobloch, Works Manager of the Cleveland Tractor Company, Vice-President and Works Manager; F. M. Zeder, Vice-President and Chief Engineer; C. D. Fleming, of the Cleveland Tractor Company, Treasurer; E. D. Wilson, formerly Sales Manager of the Willys Corporation, General Motor Car Sales Manager; O. R. Skelton, formerly in the engineering departments of the Willys and Studebaker Corporations and the Packard Company, Assistant Chief Engineer; Carl Breer, formerly in the engineering departments of the Willys and Studebaker Corporations, Assistant Chief Engineer; J. O. Hahn, formerly branch manager in several cities for the Studebaker Corporation, also will be associated with the company.

The Cleveland Tractor Company is an Ohio corporation with a capital of \$6,000,000. It owns a large plant in Cleveland, where Cletracs have been turned out for more than five years. Its tractors are being used in 65 countries throughout the world, and present plant facilities and shop organization will make it possible to proceed with the manufacture of the new Zeder with a comparatively small expenditure and without impairing the production program on tractors and trucks. The productive capacity of the factory will be 50 automobiles and 50 tractors a day. To provide for this increased space, an expenditure of about \$1,250,000 will be necessary.

American-LaFrance Moves New York Offices

The American-LaFrance Fire Engine Company, Inc., Elmira, N. Y., on May 1 moved the offices of this company and of S. F. Hayward & Company, its subsidiary, from their location at 250 West 54th Street to the new Fisk Building on 57th Street between Broadway and Seventh Avenue, New York City. The new offices will take up most of the twenty-second floor, affording ample facilities for the growing activities of these two concerns.

The new suite contains private offices for James Russell Clarke, president of the American-LaFrance Fire Engine Company, and new quarters for the representatives of the Apparatus Sales department, R. D. Hazard, Clarence D. Stewart, O. F. Bentell, and



Bituminous Distributors

Like the motor truck itself, the problems surrounding the development of Bituminous Distributors have been varied and complex. The economic success of both units depends upon three fundamentals:

simplicity of construction
 quality of materials used
 and built-in safety factors.

The combination of a Mack chassis and a Chas. Hvass bituminous distributor has proved its great economic value over a long period and is well known by contracting road builders, city and state engineers throughout the country.

The Hvass Distributor is offered in three standard types that meet every conceivable requirement of highway dressing and maintenance with bituminous material:—

Heavy Bituminous Distributor
 Mechanically Driven Air Com-
 pressor and Fuel Oil Burner

Heavy Bituminous Distributor
 Centrifugal Pump and Fuel
 Oil Burner

Light Bituminous Distributor

◆ ◆ ◆

"Bulletin 17" gives detailed descriptions of these pieces of apparatus and outlines their many operating advantages. A copy will be sent upon request. Write today.

INTERNATIONAL MOTOR COMPANY, 25 Broadway, New York

Branches owned by this company operate under the titles of: "MACK MOTOR TRUCK COMPANY" and "MACK-INTERNATIONAL MOTOR TRUCK CORPORATION."



Capacities: 1½ to 7½ tons.
Tractors to 15 tons.

"PERFORMANCE COUNTS"

George E. Morely. The Sundry Sales Department under Hugh Logan, manager, and R. C. Engels, New York branch manager, has also been provided with larger offices and better facilities for service.

Facilities for show purposes and service have been arranged for by securing a large and well-equipped garage with a floor space of 12,000 square feet, located a few blocks west at 615 West 57th Street. The service work will be in charge of Fred Flosdorf, delivery engineer, who, for the past several years, has been in charge of this work at the old office.

An Asphalt Material for Road Repair

A specially prepared asphalt for repairing joints and cracks in concrete roads and for general repair work in filling depressions, ruts or openings which have been made in the roadway has been brought out under the name "Road Solder" by the Waring-Underwood Company, Fernwood, Pa. It is claimed that this material has greater adhesive qualities than ordinary tar or asphalt and has a body which allows it to withstand the wear and tear of traffic. A slight amount of additional skill or care is required in handling Road Solder, but it is claimed that the results obtained justify this extra labor cost. In the long run, it is believed, the initial labor cost is less than the continued cost of repairs when made with light-bodied bituminous materials.

In view of the fact that the ordinary cracks or joints in any one section of a road require a relatively small amount of filling material, equipment which is quite small is ample. The use of a compact outfit will allow even one man to operate to full efficiency, and the useless heating and wasting of excess materials will be avoided. The outfit used should have a heating capacity just as little as possible in excess of the amount of material required for one continuous joint or transverse crack. The repairing material can be melted while the crack or joint is being cleaned out, and after filling the joint or crack the outfit can be easily moved to the next operation. Such a procedure will more readily give assurance that each joint or crack has been properly repaired. The following portable outfit, which costs between \$45 and \$60, can be carried in a side-car motor-cycle or light automobile:

- 1 plumber's torch
- 2 3/4-gallon ladles
- 1 bale hook
- 1 2-gallon gasoline can
- 1 street broom
- 1 plumber's furnace
- 1 sand shaker
- 1 wire brush
- 1 hatchet
- 1 point chisel
- 1 1 1/2-inch brick chisel
- 1 machinist's 2-pound hammer
- 1 or more drums Road Solder (90 pounds each)

The joint or crack should be chiseled out to a depth of at least one inch and brushed clean with a stiff wire or heavy bristle brush. If a plumber's torch is included in the outfit, it is advisable to use the torch along the joint space to dry out moisture and partially warm up the concrete. The Road Solder, heated to about 400 degrees Fahrenheit, is then poured into the

joint space from a small ladle or dipper having a rather narrow lip and holding about 1/2-gallon or 6 pounds. This small pouring ladle will allow material to be freely and accurately poured without waste. The consistency of the material is such that it will remain at a somewhat higher level than the surface of the concrete and will be gradually compressed by the traffic to an even surface. Dust from the road surface should be brushed over the repaired joint or crack. This dust will adhere to the repairing material and cause it to become a grayish or slate color and, as it will not bleed under the action of the sun, the repaired joints and cracks will be less noticeable than if made with other materials. It is claimed that repairs made with this material, when properly employed, should not require further attention for at least two years.

Is Water-Main Cleaning Effective?

Within the last five or six years, a large number of cities have contracted with the National Water Main Cleaning Company, Hudson Terminal Building, New York City, to remove incrustations, tubercles and deposits from water-mains of all sizes by the National method. This method consists in opening up two points of a main, one point where the machine can be inserted and another where the material removed from the interior of the main is permitted to escape after it has been cut off by the machine and forced ahead by water. A survey of a number of cities which have had their mains cleaned has resulted in an interesting collection of data regarding the effectiveness of water-main cleaning, which is summarized in the following brief paragraphs:

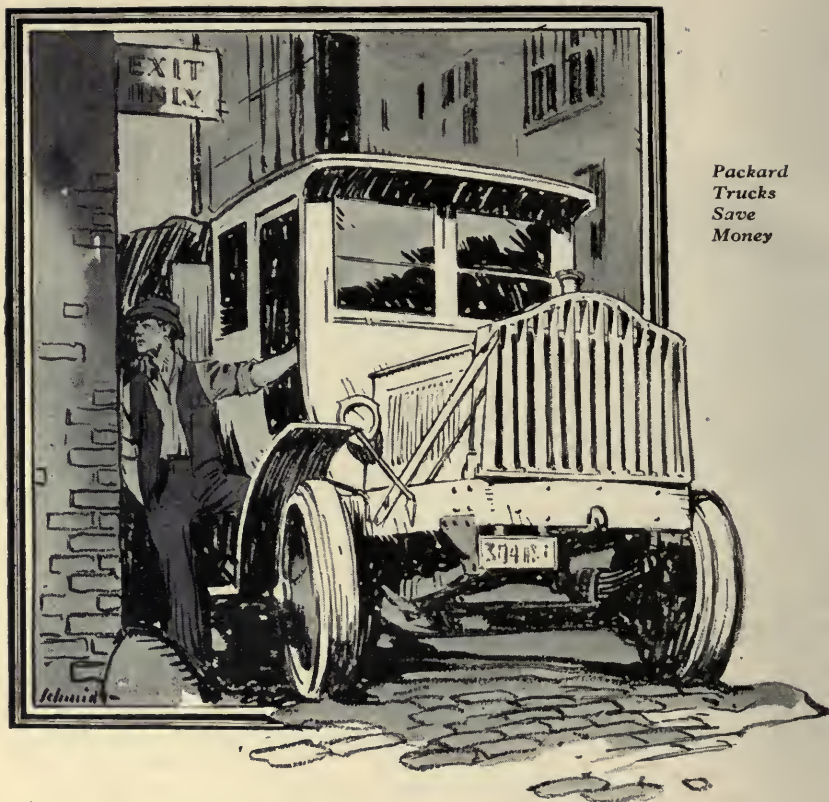
In 1916 and 1917, the water-mains of the Bloomsburg Water Company, Bloomsburg, Pa., were cleaned. Under date of March 31, 1922, this company states that although there has been no further inspection made for the results of the water-main cleaning, no diminution of flow has been noted since the cleaning nor have any unfavorable aspects in the area cleaned seemed to require investigation.

The mains of the Stroudsburg Water Supply Company, Stroudsburg, Pa., were cleaned in 1912, at which time an amazing quantity of barnacles was removed. It was considered at that time by the company that the cleaning was as valuable as the laying of new lines would have been, and after ten years there has been no change of opinion.

Mains were cleaned in Salt Lake City between 1913 and 1917. It has not been necessary to open up these mains to full capacity, so that specific information regarding their physical condition is not available. However, the Superintendent of Water Works, W. K. Burton, states that as soon as funds will permit he expects to have more lines cleaned.

The mains of Altoona, Pa., were cleaned in 1914. Pressure tests on the fire hydrants on these mains have shown no decrease since that time.

In 1915 the mains in Bra'dock, Pa., were cleaned. The engineer in charge stated that



Packard
Trucks
Save
Money

It is perfectly plain that the Packard Truck never could have attained outstanding leadership were it not a sound, saving investment, from every viewpoint of truck operation.

The comparatively low purchase price of Packard Trucks—generally lower than prices of other trucks of comparable quality—adds great emphasis to Packard value.

The seasoned and stable organization building the Packard Truck will continue to advance and fortify still further its leadership and its reputation for lower-cost haulage.

Packard Trucks range in capacity from 2 tons, to 7½ tons; and in price from \$3,100 to \$4,500

PACKARD MOTOR CAR COMPANY, DETROIT



Packard Service

In 585 Cities and towns throughout the United States, Packard Truck Service stations give owners highly skilled service at a reasonable cost. Packard Truck costs, always low because sound, Packard construction minimizes need of repair, are held still lower by this expert, broadcast service.

PACKARD TRUCKS

they had no necessity to take up any of the pipe cleaned in this operation, but, as it is on a rising main and the friction head in the main nearly constant, they do not believe there has been much incrustation since the cleaning. The water, prior to the cleaning, was untreated, but since that has been treated with lime to neutralize the acidity, which may be a reason that deposits do not occur.

The Town Clerk of Sackville, New Brunswick, reports that their mains were cleaned in 1918 and that, although there has been no occasion to open up the lines since that time, they feel that the system was greatly benefited and that they are still enjoying the beneficial results of the work.

The mains cleaned in the village of Briarcliff Manor, N.Y., in 1913, are reported to be in excellent condition, and from general usage there is no evidence of reduced pressure which would be caused by the pipes' being again in a scaled condition.

The Water and Light Department of Ottawa, Kans., reports that the mains which were cleaned in that city were those used for delivering the water from the river to the main pumping station about three-quarters of a mile apart. There has been no decrease in the flow sufficient to indicate any serious obstruction since the cleaning.

In 1914 several miles of 6-inch main were cleaned in Durham, N.C. These mains had been in use supplying a cotton mill and the village since 1886. The efficiency of the main was doubled by the cleaning, and notwithstanding the growth of the community, the mains are still giving very satisfactory service.

A System of Traffic Signaling

The subject of traffic regulation in our congested city streets is one of ever-increasing importance and is constantly being given more thought and study. The result of this study on the part of engineers of the Federal Signal Company, Albany, N. Y., shows that traffic signals should be consistent in their indications, that is, the indications given by day should be the same as those given by night, conveying information to traffic in the same manner at all times when the signal is in operation. The "Go" indication for a certain direction of traffic should be given at all crossings in a particular zone at the same time, thus greatly facilitating the movement of traffic. Studies of this method of control show an enormous increase in the amount of traffic that can be handled past a given point in a given time.

The Federal Signal Company's traffic signal system claims to accomplish this by means of colored lights. The signal itself consists of a box-shaped head having two compartments, provided on all sides with suitable colored lenses. The lenses are shaded from the rays of the sun by hoods. The head is of such size that an electric bulb, having a concentrated filament, is located in a compartment at the focal point of the four lenses. This arrangement gives a

positive indication in four directions that is visible under the most adverse sunlight conditions, as well as at night, so that when a "Go" signal is given for east and west, a "Stop" signal is given for north and south, and vice versa. The colors used should be standardized so that the same indication will convey the same meaning in all locations wherever used.

To allow moving traffic to clear the crossing, and to prepare waiting traffic to move, a transition signal indication is given by using a yellow Fresnel lens, which shows an elongated yellow light in all directions for a predetermined length of time. A red Fresnel lens may also be used for this purpose, but yellow is recommended. The head may be supported by brackets attached to poles at the corner of the sidewalk, on a pedestal in the center of the crossing or suspended over the center of the crossing. The height and exact location of the signals should be determined by local conditions of clearance and other factors.

It has been found that traffic can be expedited by so arranging the control of the traffic signals that traffic in a particular zone will all move in a certain direction at one time for a predetermined period and then be brought to a stop and traffic in the cross direction moved. To accomplish this method of control, the Federal Signal Company has an automatic control device which may be located at any point desired. This device controls all the traffic signals in a particular zone and is so designed that the time intervals for "Go" indications may be adjusted to suit the traffic requirements in the control zone. The time intervals can have a range of from 30 seconds to 2 minutes for the "Go" indication and from 5 to 12 seconds for the transition indication. The change in the time interval is readily made on the automatic control device, and the change can be accomplished without interruption to the operation of the signals. In addition to the automatic control, a mechanical control is provided for the signals at each crossing, thus permitting the operation of the signal at every crossing by a traffic officer, if for any reason such operation is found desirable. This manual operation does not affect the automatic operation of any of the other signals. At each crossing there is provided a single-stroke gong which rings when the signal indication changes, and calls the attention of the public and the traffic officer to the change.

Bi-Lateral Moves Offices

Clay Baird, President, Bi-Lateral Fire Hose Company, Chicago, Ill., has just announced that the offices of this company have been moved from 326 West Madison Street to 9 South Clinton street, Chicago, Ill.

Shepherd and Hovey Join Forces

C. H. Shepherd and S. S. Hovey have announced the organization of Shepherd & Hovey, consulting engineers, with offices at 53 West Jackson Boulevard, Chicago, Ill.

General Motors Trucks



One Ton GMC Used by Detroit Police Department

Particularly Suited for the Pick-Up Work of Detroit Police Department

A variety of hauling is given to the one ton G M C truck that is used by the Detroit police department in connection with its motorized patrol system. This sturdy truck, a successor to the famous Model 16 that was adopted as standard by the United States army, is used particularly for rush deliveries of various kinds within the department.

Used by Many Cities

Some of the other city departments in Detroit are also using G M C trucks, for their hauling and their service, as always, has been satisfying. In fact, G M C trucks now are offering more continuous transportation than has heretofore been found in a motor truck. Advanced improve-

ments have been built into these trucks which contribute directly to more economical and better haulage.

Sets New Standard

In price also G M C trucks have set a new standard. Their cost, in comparison to their exclusive features and their thorough high quality construction, is remarkably low.

The chassis now list at the factory as follows: One Ton, \$1295; Two Ton, \$2375; Three and One-Half Ton, \$3600; Five Ton \$3950, tax to be added.

Write for a booklet giving details of these trucks or ask the nearest G M C dealer to show them to you.

GENERAL MOTORS TRUCK COMPANY

Division of General Motors Corporation

Pontiac, Michigan

DEALERS AND SERVICE IN MOST COMMUNITIES

Wagon Loaders in English Road Construction

One of the largest road-building organizations in England is using the Haiss path-digging wagon loader, shown in the illustration, for digging and loading tar macadam, which is much used by English road builders on their roads. This material consists of crushed stone mixed with tar, weighing 170 pounds to the cubic foot. It is of such consistency that laborers can hardly shovel it. Before using loaders, laborers forked it, but it was such a sticky, gummy material that they could not handle it for more than an hour without resting. Over eight months ago this English company bought a path-digging wagon loader from the British representatives of the George Haiss Manufacturing Company, 143d Street and Rider Avenue, New York City, for this work. The readiness with which the machine handles the sticky material has been due in large measure to the self-feeding propellers, which cut into the material and push it towards the bucket, where it is elevated. The machine has been readily loading a 5-meter truck in from five to six minutes.

English road builders are very favorably impressed with American machinery, and at the present time there is quite a demand in Great Britain not only for wagon loaders, but also for American-made concrete mixers, steam shovels and other such material-handling devices.



LOADING TAR MACADAM BY MACHINE

A New Highway Patrol Outfit

With the increasing number of roads which are being maintained by the individual patrol system, new apparatus for this type of work has been developed. The Road Repair Equipment Company, 165 Broadway, New York City, has recently placed on the market a portable heater and mixing machine of sufficient size to repair a hole three square feet in area in one operation. The machine is at the same time small enough to be handled by one man.

The heater is designed similar to a wheelbarrow, with a special body mounted in place of the wheelbarrow body. The special body contains a secondary solid body or tray with a given space between the tray and the body.



USING THE NEW WHEELBARROW TYPE ROAD REPAIR MATERIAL HEATER

DANGER STOP LOOK LISTEN

The hot summer months are coming. Have you complete and efficient equipment for your street department and for the collection of your garbage?

Will your equipment serve so as to produce that clean, sanitary condition, so necessary to good health during the period of extreme heat?

Let us help you

**TIFFIN FLUSHERS FOR YOUR
STREETS. TIFFIN GARBAGE EQUIP-
MENT FOR THAT DEPARTMENT**

Write for catalog

THE TIFFIN WAGON COMPANY, TIFFIN, OHIO

REDUCE TRAFFIC ACCIDENTS

Five of these lights installed in an Ohio city "have been a big addition in the regulation of traffic and have been a means of reducing traffic accidents at those certain sections about one-half."

The Milwaukee Type Mushroom Traffic Light stands only 8 inches high, is made of cast steel and equipped with a dual lighting system. When lighted it is a bright spot on the road without glare and, although not large, is big enough to be noticed and respected. These traffic guides are suitable for installation at street crossings, on heavy traffic streets and boulevards.

ELECTRICAL & SPECIALTY SUPPLY CO.
Madison Terminal Building, Chicago, Illinois



In this space there is mounted a gasoline burner from which a hot flame spreads over the bottom of the tray, producing a uniform heat throughout the area of the tray. This gasoline burner is fed from a tank mounted on the handles of the heater immediately in front of the body, permitting free use of the handles and also protecting the tank from any damage. Attached to the tank is a hand force pump for application of air to the gasoline for proper mixture. By a needle valve, the proper flow of gasoline to the valve may be controlled by the operator. If the operator desires to put the heater out of service for a time, he can lower the flame and save gasoline. The heater may be put back into service by simply turning the needle valve.

A patrolman, inspector or workman may start off in the morning with the heater, loading it with stone, bituminous material and tar from supplies which have been previously located along the road, and then, upon reaching the first hole, light the heater, heat the mixture, turn it over with the shovel until the proper mixture and heat are reached, then dump the mixture into the hole, leveling and tamping it into place. The complete operation requires less than five minutes.

A Convertible Street-Sweeping Machine

For the last two winters municipal officials have been interested in the Fox Rotary Snow Broom, manufactured at 2 Lombardy Street, Newark, N. J., which has so effectively cleaned the streets in a number of communities in New Jersey. This machine consists of a circular broom with a horizontal axis mounted at the front of a motor truck. It has been found very effective in rolling the snow up and to the side of the road.

The most recent development in the use of this machine has been the addition of a 250-gallon tank and a 50-horse-power pressure

pump, by which the machine is converted into a useful street sweeper for summer service. Water is sprayed through nozzles in front of the broom, as shown in the illustration. The broom is well boxed in the front, preventing the scattering of dirt and other refuse. The sheet steel parts are easily removed when the machine is to be used for snow work. When the outfit is working in the winter time, the water-tank is used as ballast, being filled with gasoline. Thus the machine as now built constitutes an all-year-round apparatus for removing street dirt in summer and snow in winter.

Early in April one of these machines was demonstrated at Bayonne, N. J., before nearly 50 engineers from New York and other municipalities in the metropolitan district. Trips were made up and down various blocks, including streets paved with cobbles, which are very difficult to clean under any conditions. Four trips up and down were made in less than five minutes, cleaning the pavement completely. The machine operates at the rate of 12 miles per hour, which is practically double the speed of most other street-cleaning machines.

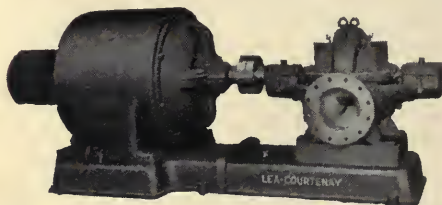
J. T. Martin Joins Cleveland Engineers

The Frazier-Ellms-Sheal Company, Illuminating Building, Cleveland, Ohio, has announced the association of J. T. Martin, former Water Commissioner of Cleveland, as an active member of the company in the capacity of Vice-President and Treasurer. Mr. Martin has been actively engaged for over 20 years in water-works projects, covering the construction of tunnels, reservoirs, distribution systems, filtration and power-plants, water-works accounting and administration. As Water Commissioner of Cleveland, he organized, planned and commenced the execution of a water-works improvement of greater magnitude than the city had ever previously attempted.



A ROTARY BROOM SWEEPER FOR CITY STREETS

LEA-COURTENAY CENTRIFUGAL PUMPS



Lea-Courtenay 12", double-suction volute pump, motor-driven.

This same type of pump driven by a steam turbine will deliver 2000 G.P.M. against 150-foot head (average city pressure) at 2000 R.P.M. By increasing speed 10% the pressure can be increased to 100 lbs., and to deliver 1500 G.P.M., which is Standard Fire Protection Pressure.

"Specialization is the direct road to perfection"

said a prominent engineer in discussing the modern trend of manufacturing. And the thought was a sound one: that perfection of product can most nearly be attained by concentration of thought and effort to that product only.

The L-C Company are specialists in building centrifugal pumps. Every effort of this company is wholly devoted to designing and manufacturing centrifugal pumps of the very highest quality and efficiency.

This specialization has enabled the L-C Company to rigidly adhere to the very highest standard possible in centrifugal pump design, manufacture, and test. There are no other manufacturing activities in the L-C plant to which this standard might be sacrificed. L-C Pumps may be installed with the assurance that in dependability and efficiency they represent the very highest development in centrifugal pump construction.

There is a complete line of L-C Pumps including fire, boiler-feed, single-and multi-stage.

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